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# Final Environmental Impact Statement (FEIS)
# For The K Road Moapa Solar Facility
# Clark County, Nevada

March 2012

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Prepared for:

U.S. BUREAU OF INDIAN AFFAIRS
U.S. BUREAU OF LAND MANAGEMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
U.S. ARMY CORPS OF ENGINEERS

On behalf of:

**The Moapa Band of Paiutes**

**US Army Corps of Engineers**

Report Prepared By:

**ARCADIS-US, Inc.**

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- **K. U.S. Army Corps of Engineers Jurisdictional Determination Report and Consultation**
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- **M. Public Comment and Agency Correspondence**
- **N. Environmental Hazardous Radius Report**
- **O. Bird and Bat Conservation Strategy**
- **P. Decommissioning Plan**

## Acronyms Used in the EIS

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| ABPP | Avian and Bat Protection Plan |
| AC | Alternating current |
| ACEC | Areas of Critical Environmental Concern |
| acft | Acre-feet |
| ADEIS | Administrative Draft Environmental Impact Statement |
| AFY | acre feet a year |
| APE | Area of Potential Effect |
| ASME | American Society of Mechanical Engineers |
| APP | Avian Protection Plan |
| BGEPA | Bald and Golden Eagle Protection Act |
| BIA | Bureau of Indian Affairs |
| BLM | Bureau of Land Management |
| Blvd. | Boulevard |
| BMPs | Best Management Practices |
| CAA | Clean Air Act |
| CDP | Census Designated Place |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| cm | centimeter |
| CO | Carbon monoxide |
| $CO_2e$ | $CO_2$ equivalent |
| CPV | Concentrating photovoltaic |
| CSI | Coyote Springs Investment |
| CSP | Concentrating solar power |
| CT | Census Tract |
| CWA | Clean Water Act |
| DAQEM | Department of Air Quality and Environmental Management |
| dBA | decibel |
| DC | Direct current |
| DEIS | Draft Environmental Impact Statement |
| DEMs | Digital Elevation Models |
| DOT | Department of Transportation |
| DWMA | Desert Wildlife Management Area |
| EIS | Environmental Impact Statement |
| EPA | Environmental Protection Agency |
| EPC | Engineering, Procurement and Construction |
| EPRI | Electric Power Research Institute |
| ESA | Endangered Species Act |

| | |
|---|---|
| ESU | Evolutionary Significant Unit |
| FEIS | Final Environmental Impact Statement |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FLPMA | Federal Land Policy Management Act |
| FTE | Full-time Equivalent |
| GHG | Greenhouse Gas |
| GIS | Geographic Information System |
| gpm | gallons per minute |
| GPS | Global Positioning System |
| HA | Hydrographic Area |
| HMA | Herd Management Area |
| hp | Horsepower |
| I-15 | Interstate 15 |
| IBC | International Building Code |
| IECC | International Energy Conservation Code |
| IPCC | Intergovernmental Panel on Climate Change |
| IPP | Intermountain Power Project |
| ITA | Indian Trust Assets |
| JD | Jurisdictional determination |
| KOPs | Key Observation Points |
| K Road | K Road Moapa Solar LLC |
| kV | kilovolt |
| LADWP | Los Angeles Department of Water & Power |
| LEP | Limited English Proficiency |
| LOS | Level of Service |
| LWC | Lands with Wilderness Characteristics |
| m | meter |
| MBTA | Migratory Bird Treaty Act |
| mm | millimeter |
| MOA | Memorandum of Agreement |
| mph | miles per hour |
| MMT | Million Metric Tons |
| MSDS | Material Safety Data Sheet |
| MSHCP | Multiple Species Habitat Conservation Plan |
| MVWD | Meadow Valley Water District |
| MW | Megawatt |
| NAAQS | National Ambient Air Quality Standards |
| NAC | Nevada Administrative Code |
| NAD | North American Datum |
| NCCAC | Nevada Climate Change Advisory Committee |
| NDEP | Nevada Department of Environmental Protection |
| NDOT | Nevada Department of Transportation |

| | |
|---|---|
| NDOW | Nevada Department of Wildlife |
| NDWR | Nevada Division of Water Resources |
| NEC | National Electric Code |
| NEMA | National Electrical Manufacturers Association |
| NEPA | National Environmental Policy Act |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NNHP | Nevada Natural Heritage Program |
| NOA | Notice of Availability |
| NO2 | Nitrogen dioxide |
| NOI | Notice of Intent |
| NOx | Nitrogen Oxide |
| NPDES | National Pollution Discharge Elimination System |
| NPS | National Park Service |
| NRCS | National Resources Conservation Service |
| NRHP | National Register of Historic Places |
| NRS | Nevada Revised Statute |
| NSR | New Source Review |
| NV | Nevada |
| $O_3$ | Ozone |
| O&M | Operations and Maintenance |
| OEM | Original Equipment Manufacturer |
| OHV | Off Highway Vehicle |
| OSHA | Occupational Safety and Health Administration |
| PBO | Programmatic Biological Opinion |
| PCEs | Primary Constituent Elements |
| PM | Particulate Matter |
| POD | Plan of Development |
| PPA | Power Purchase Agreement |
| PPE | Personal protective equipment |
| psi | Pound(s) per square inch |
| PV | Photovoltaic |
| PVC | Polyvinyl Chloride |
| RCRA | Resource Conservation Recovery Act |
| Reservation | Moapa River Reservation |
| RO | Reverse Osmosis |
| ROD | Record of Decision |
| ROW | Right(s) of Way |
| RPA | Remotely Piloted Aircraft Systems |
| RPS | Renewable Portfolio Standard |
| SCADA | Supervisory control and data acquisition |
| SHPO | State Historic Preservation Office |
| SIP | State implement plan |

| | |
|---|---|
| SMAs | Special Management Areas |
| SNWA | Southern Nevada Water Authority |
| SO2 | Sulfur dioxide |
| SPCC | Spill Prevention, Control and Countermeasures Plan |
| SWIP | Southwest Intertie Project |
| SWPPP | Storm Water Pollution Prevention Plan |
| T&E | Threatened and Endangered |
| TDS | Total Dissolved Solids |
| TERO | Tribal Employment Rights Ordinance |
| Travel Plaza | Moapa Travel Plaza |
| Tribe | Moapa Band of Paiute Indians |
| TSDF | Treatment, Storage and Disposal Facility |
| µm | micrometer |
| UMC | Uniform Mechanical Code |
| UPC | Uniform Plumbing Code |
| URTD | Upper Respiratory Tract Disease |
| U.S. | United States |
| USACE | United States Army Corps of Engineers |
| USCB | United State Census Bureau |
| USDA | United States Department of Agriculture |
| USDI | United States Department of the Interior |
| USFS | United States Forest Service |
| USFWS | United States Fish and Wildlife Service |
| USGCRP | U.S. Global Change Research Program |
| USGS | United States Geological Survey |
| USTs | Underground storage tanks |
| UTM | Universal Transverse Mercator |
| VOC | Volatile Organic Compounds |
| VRI | Visual Resource Inventory |
| VRM | Visual Resource Management |
| WEAP | Worker Environmental Awareness Program |
| WSA | Wilderness Study Areas |
| °C | degrees Centigrade |
| °F | degrees Fahrenheit |

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# ES. Executive Summary

The following sections summarize the Final Environmental Impact Statement (FEIS) for the K Road Moapa Solar Project. This information is provided as a synopsis for the public, but is not a substitute for review of the complete FEIS. This summary provides a general overview of the Proposed Project and its purpose and need; briefly describes the Proposed Action by the Bureau of Indian Affairs (BIA) as the lead agency as well as the Bureau of Land Management (BLM) (Cooperating Agency), collectively the Proposed Project and other alternatives; and summarizes major impacts for key resources associated with the Proposed Project and alternatives. Other Cooperating Agencies associated with this document include the U. S. Environmental Protection Agency (USEPA Region 9), United States Corps of Engineers (USACE) and the Moapa Band of Paiute Indians (Tribe).

K Road Power (The Applicant) has entered into an agreement with the Moapa Band of Paiutes (Tribe) to lease land, up to 50 years, on the Moapa River Indian Reservation (Reservation) for the purposes of constructing and operating a 350MW PV solar generating station and associated infrastructure (the Proposed Project –see Figure 1-1). The Tribe is federally recognized and has a Constitution approved by the Secretary of the Interior on April 17, 1942. The tribal lands originally set aside in 1874 consisted of two million acres, but in 1876 it was reduced to a thousand acres. In December 1980, 70,000 acres were added. The current total land base is 71,954 acres and is held in trust by the U.S. government for the Moapa Band of Paiute Indians.

## ES.1 INTRODUCTION

The Proposed Project would be located on approximately 2,153 acres of land and have impacts to resources on up to 8,153 acres of land within the Reservation and upon 10.5 acres of Bureau of Land Management (BLM) land (for a right-of-way). The 2,000 acre solar facility is wholly within the Reservation as well as a proposed 6,000 acre desert tortoise relocation area. An additional 5,000 acres (2,500 acres north and south of the mesa adjacent to Interstate 15 [I-15] and on the Reservation) has also been set aside for potential desert tortoise relocation if needed. The remaining 153 acres is comprised of a high voltage transmission line up to 500 kilovolt (kV), a 16-24 feet wide access road approximately 8 miles long, a approximately 1-mile water pipeline and the approximately 3-mile 12kV transmission line linking the Moapa Travel Plaza (Travel Plaza) on the east side of I-15 to the Proposed Project substation (Figure 1-2) which will facilitate access to the electric grid for the Travel Plaza.

The Proposed Project would be built in three phases. The first phase would consist of the construction and operation of an approximate 150MW solar plant including associated facilities. Phases two and three would add approximately 100MW each in a consecutive manner. The electricity generated from this plant will be sold to market via a Power Purchase Agreement (PPA). The facility will utilize transformers to step up the voltage to interconnection voltage to facilitate a connection of the facility with one or more of the following: the existing 230 kV Crystal substation operated by NV Energy outside tribal lands, and/or the existing 500 kV Crystal substation located outside tribal lands.

The Proposed Project is dependent upon approval by the Bureau of Indian Affairs (BIA), pursuant to 25 U.S.C. §415, of a solar energy ground lease and associated agreements for transmission lines (500kV, 12kV and water pipeline) and access road Rights of Way (ROW) solely on Reservation land entered into between the Tribe and Applicant (BIA's Proposed Action). The Proposed Project includes the BLM approval of an electric transmission and access road ROWs (BLM ROW application NVN-089716) in response to a Federal Land Policy Management Act (FLPMA) ROW application submitted by the Applicant, 5.0 miles of which is located on the Reservation within the utility corridor and 0.5 miles of which is located on BLM land just south of the Reservation boundary (BLM Proposed Action). The existing utility corridor is administered by the BLM in accordance with P.L. 96-491 (the Moapa Utility Corridor and the Moapa Act) and reserved to the BLM under Public Law 96-491-Dec. 2, 1980. This ROW is in Township 17 South, Range 64 East, Section 10, and Township 16 South, Range 64 East, Sections 33, 27, 23 and 13 (See Figure 1-2). The construction of the Proposed Project will provide the Tribe with the opportunity to connect its Travel Plaza with the transmission grid via the construction of a 12kV transmission line that will connect directly to the solar facility substation.

**Table ES-1.**
**Agency Proposed Actions**

| Agency | Action |
|---|---|
| BIA | Approval of Solar Energy Ground Lease |
| | Approval of access road, 500kV transmission line, 12kV transmission line, and water pipeline ROWs solely on the Reservation. |
| BLM | Approval of the 500kV transmission line ROW within the utility corridor |
| | Approval of the access road ROW within the utility corridor |
| Tribe | Approval of access road, 500kV transmission line, 12kV transmission line, and water pipeline ROWs solely on the Reservation. |

## ES.2 PURPOSE AND NEED

The purpose of the Proposed Project is to construct a 350MW solar generation facility and associated infrastructure on the Reservation in Clark County, Nevada. The primary need for the Proposed Project is creating economic development opportunity for the Tribe as well providing lease income as a revenue source, creating new jobs and employment opportunities for Tribal members, development of sustainable renewable resources, and other benefits to the Tribe, such as connection of the Travel Plaza to the electric grid, by using the Tribe's solar resources (land with exposure to levels of high solar radiation). Secondly, to assist utilities in meeting their renewable energy goals by providing clean renewable electricity generation from the Tribe's solar resources that may be efficiently connected to existing transmission lines in a manner that minimizes adverse site impacts.

The States of Nevada and California have established a Renewable Portfolio Standard (RPS) that all public utilities must meet by investing in, and partnering with, commercial project developers to purchase renewable generated power, and participate in turnkey projects and/or co-development of renewable projects. The RPS mandates that 25 percent of retail sales come from renewable resources by 2025 (33 percent in California). It is expected that at least 1,000 MW of new solar power will be required annually to meet this need in Nevada and 13,000 MW in California; both could be serviced by this Proposed Project.

The Reservation was selected due to its solar resource potential, the availability of suitable land, transmission accessibility, and absence of land use constraints (i.e., Desert Wildlife Management Areas [DWMAs], Areas of Critical Environmental Concern [ACECs], designated Wilderness Areas, Wilderness Study Areas [WSAs], Lands with Wilderness Characteristics (LWC) and other restrictive land use designations).

The site of the Proposed Project would minimize environmental impacts, infrastructure needs, and costs by being located near existing infrastructure such as the utility corridor and the Crystal substation. The Proposed Project would contribute to the local economy by creating employment opportunities, provide the Tribe accessible energy transmission infrastructure, generate lease and other income for the tribe, and facilitate expenditures in local businesses.

The Proposed Project would further the objectives of the federal government to eliminate or reduce greenhouse gas (GHG) emissions and promote the deployment of renewable energy technologies. In addition, the Proposed Project also would help displace older fossil-fuel electric generating facilities with clean, renewable power, which would contribute to the reduction of GHG emissions.

## ES.3 PUBLIC INVOLVEMENT

**Scoping**. An initial 30-day scoping period for the Proposed Project was held from February 4, 2011 to March 7, 2011. The scoping period commenced with publication of the Notice of Intent (NOI) in the Federal Register (76 FR 24:6493-94) on February 4, 2011. The NOI announced a period for public scoping of alternatives, issues, impacts, and planning criteria. The BIA and Tribe held two public scoping meetings near the Proposed Project location. Meeting locations, dates, and numbers of attendees are provided below:

| Location | Date | No. of Attendees |
|---|---|---|
| Reservation Tribal Hall | Feb. 23, 2011 | 29 |
| BLM North Las Vegas Office | Feb. 24, 2011 | 27 |

Concerns of commenters included:

- Impacts to vegetation and resultant stormwater runoff
- Potential impacts to rare plant species
- Impacts from cumulative projects in the vicinity of the Proposed Project
- Impacts to ephemeral streams or desert washes pertaining to water quality and habitat
- Viable alternatives to the Proposed Project
- Impacts to Air Quality as a result of construction and operations
- Proposed Project impacts and cumulative impacts to desert tortoise

## ES.4 ALTERNATIVES

This document analyzes two project alternatives plus the No Action Alternative. This document also discusses alternatives that were considered but eliminated from further consideration. The Proposed Project is the Proposed Action. The alternatives are described in detail in Chapter 2 and are summarized below.

### The Proposed Project

The Proposed Project would authorize the Applicant to construct, operate, maintain, and decommission (or transfer to the Tribe at the end of lease, pursuant to lease terms) an up to 350MW solar photovoltaic (PV) power plant on Tribal lands within the Reservation located in Clark County, Nevada.

The Proposed Project facilities and related facilities would disturb an approximate total area of 2,153 acres and potentially impact 8,153 acres out of 71,954 acres of the Reservation. The solar arrays, substation, and operations building and parking would be contained within a 2,000 acre solar facility footprint; the up to 500kV transmission line corridor (up to 150-feet wide) would impact approximately 100 acres and have a length of approximately 5.50 miles; the water line (25-feet wide) would impact approximately 3 acres and have a length of approximately 1 mile; the 12kV transmission line (25-feet wide) would impact approximately 9 acres of land, half of which is currently an unimproved road, and have a length of approximately 3 miles. The 12kV transmission line would be constructed after Phase 1 of the solar facility is complete. Impacts resulting from access roads would be minimal as existing improved and unimproved roads would be utilized and upgraded or expanded to 16-24 feet in width. The existing utility access road that originates from Las Vegas Boulevard and provides direct access to the Crystal substation will be the primary access route for the Proposed Project. Use of diesel generators at the Travel Plaza to produce electric power would be discontinued.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

The Proposed Project is designed to be constructed in three phases consisting of 100MW to 150MW sections within the solar facility boundary. The reduced solar facility footprint would only complete phases 1 and 2 and impact approximately 1,400 acres of land and produce 250MW of solar electricity. This alternative would also utilize an alternative corridor for the up to 500kV transmission line ROW. The alternative ROW would be a direct route to the existing Crystal substation and impact less overall acreage for construction; however, it would traverse an open area of the desert outside of the existing utility corridor. The 12kV transmission line to the Travel Plaza and water pipeline would also be constructed impacting an additional 10 acres. Use of diesel generators at the Travel Plaza to produce electric power would be discontinued.

### The No Action Alternative

Under the National Environmental Policy Act (NEPA), the BIA must consider an alternative that assesses impacts that would occur if the Proposed Project were not constructed and the lease agreement and ROW easements were not approved. The No Action Alternative assumes that the lease agreement is denied, the BIA and BLM utility easements are not issued, and the solar project is not built. Under the No Action Alternative the need of the project would not be met. The site would remain available for other unidentified economic projects. Under the No Action Alternative the Tribe would not benefit economically from the energy production that can be obtained from their prime solar resources. Additionally, there would not be support or infrastructure for the interconnect of their Travel Plaza to the electricity grid. Diesel generators would continue to be used to provide electricity to the Travel Plaza.

## ES.5 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

The environmental consequences of the alternatives analyzed within the FEIS are summarized in Table ES-2. Mitigation measures have been identified where feasible and practical to address specific effects regardless of whether they are considered significant. Resource protection measures identified in the planning and design process have been incorporated into the project description. In addition, mitigation measures have been identified to address specific effects identified during the preparation of the FEIS. These measures are outlined in Table ES-2.

Table ES-2 also serves to provide a side-by-side comparison of the environmental impacts of each alternative. Impacts were analyzed by resource specialists based on information collected during field studies and visits, provided by the Applicant, obtained via public scoping, literature review, and input from state, federal, tribal, and local agencies. Environmental effects of constructing, operating, maintaining, and decommissioning the solar facility as analyzed in the Proposed Project, Alternative I and the No Action Alternative are summarized and compared in the Table ES-2.

### Table ES-2.
### Comparison of Alternatives

| Resource Element | Proposed Project Effects | Alternative I Effects (Reduced Solar Site / Alternative Transmission ROW) | No Action Alternative | Mitigation Measures |
|---|---|---|---|---|
| Climate | Short term direct and indirect impacts with contribution of NOx and VOCs during construction; long term benefits in reduction of GHG due to non fossil fuel energy generation. | Short term direct and indirect impacts with contribution of NOx and VOCs during construction; long term benefits in reduction of GHG due to non fossil fuel energy generation. | No direct or indirect effects to climate or emissions of GHGs. No long term benefit. | Car pool, reduced speed limits onsite |
| Topography | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Geology | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Soils | Short-term and potentially Long-term direct and indirect impacts from clearing of vegetation, grading, loss of cryptobiotic soil, increased erosion and compaction; cumulative adverse affects to down stream resources. | Short-term and potentially Long-term direct and indirect impacts from clearing of vegetation, grading, loss of cryptobiotic soil, increased erosion and compaction; cumulative adverse affects to down stream resources. | No direct, indirect or cumulative impacts | Site Restoration and Revegetation Plan;<br>Stormwater Pollution Prevention Plan (SWPPP) |
| Water Resources (surface) | Short-term direct effects for contamination during construction and operations; Short-term and Long-term effects to downstream flooding and sedimentation during high rain events. | Short-term direct effects for contamination during construction and operations; Short-term and Long-term effects to downstream flooding and sedimentation during high rain events. | No direct, indirect or cumulative impacts | Emergency response plan and Spill Prevention Control and Countermeasure Plan. SWPPP – maintain existing drainage patterns on-site. Develop erosion control structures and devices within existing drainages. |

### Table ES-2 Continued

| Resource Element | Proposed Project Effects | Alternative I Effects (Reduced Solar Site / Alternative Transmission ROW) | No Action Alternative | Mitigation Measures |
|---|---|---|---|---|
| Water Resources (ground) | No direct impacts to ground water. Indirect significant impacts to Moapa dace as a result of groundwater pumping. Cumulative significant adverse effects if potential projects are constructed at the same time and utilizing water from the same or nearby wells. | No direct impacts to ground water. Indirect significant impacts to Moapa dace as a result of groundwater pumping. Cumulative significant adverse effects if potential projects are constructed at the same time and utilizing water from the same or nearby wells. | No direct, indirect or cumulative impacts | No recommendations |
| Air Quality | Short-term direct and indirect effects as a result of fugitive dust and vehicle/generator emission during construction. Long-term and cumulative benefits by reducing emissions from fossil fuel energy generation. Cumulative short-term impacts if multiple projects are constructed consecutively or at the same time. | Short-term direct and indirect effects as a result of fugitive dust and vehicle/generator emission during construction. Long-term and cumulative benefits by reducing emissions from fossil fuel energy generation. Cumulative short-term impacts if multiple projects are constructed consecutively or at the same time. | No direct, indirect or cumulative impacts | Minimize grading and vegetation removal; limit vehicular speeds on non-paved roads; manage dust with water trucks; stop work during high winds; prepare a Site Restoration Plan. |
| Noise | No direct or indirect short-term, long-term or cumulative effects due to no nearby receptors; short-term direct effect to resident wildlife. | No direct or indirect short-term, long-term or cumulative effects due to no nearby receptors; short-term direct effect to resident wildlife. | No direct, indirect or cumulative impacts | No recommendations |

## Table ES-2 Continued

| Resource Element | Proposed Project Effects | Alternative I Effects (Reduced Solar Site / Alternative Transmission ROW) | No Action Alternative | Mitigation Measures |
|---|---|---|---|---|
| BIOLOGICAL RESOURCES | | | | |
| Vegetation | Short-term and long-term direct and indirect effect on vegetation onsite due to construction and operation activities, and the potential spread of invasive or noxious species; incremental contributions to significant cumulative adverse impacts. | Short-term and long-term direct and indirect effect on vegetation onsite due to construction and operation activities, and the potential spread of invasive or noxious species; incremental contributions to significant cumulative adverse impacts. | No direct, indirect or cumulative impacts | Site Restoration and Revegetation Plan; Weed Management Plan; reduce grading and clearing as much as practical; leave vegetation buffer along major drainages if practical. |
| Wildlife | Short-term and long-term direct and indirect effects as a result of: loss of habitat and forage area and nuisance from noise and human presence during construction and operations. Overall habitat loss of 2,000 acres. Cumulative impacts as a result of multiple ROWs and construction of such during the same time. Short-term adverse effects for slow-moving reptiles and species that occupy subsurface burrows. | Short-term and long-term direct and indirect effects as a result of: loss of habitat and forage area and nuisance from noise and human presence during construction and operations. Overall habitat loss of 1,800 acres. Cumulative impacts as a result of multiple ROWs and construction of such during the same time. Short-term adverse effects for slow-moving reptiles and species that occupy subsurface burrows. | No direct, indirect or cumulative impacts | Biological surveys prior to construction, grading and vegetation removal.<br>Worker environmental awareness program. |

### Table ES-2 Continued

| Resource Element | Proposed Project Effects | Alternative I Effects (Reduced Solar Site / Alternative Transmission ROW) | No Action Alternative | Mitigation Measures |
|---|---|---|---|---|
| Special Status Species | Short-term and long-term direct and indirect significant impacts to desert tortoise as a result of harassment, loss of habitat and foraging area. Short-term and long-term indirect effects to Golden Eagles as a result of loss of foraging habitat. Incremental adverse cumulative effects to desert tortoise.<br>Cumulative indirect impacts to Moapa dace as a result of increased groundwater withdrawal.<br>Short-term adverse effects for slow-moving reptiles and species that occupy subsurface burrows. | Short-term and long-term direct and indirect significant impacts to desert tortoise as a result of harassment, loss of habitat and foraging area. Short-term and long-term indirect effects to Golden Eagles as a result of loss of foraging habitat. Incremental adverse cumulative effects to desert tortoise. Additional long-term adverse impacts would result from 500kV transmission line segmenting the desert and adding additional roosting locations for avian predators. Cumulative indirect impacts to Moapa dace as a result of increased groundwater withdrawal. Short-term adverse effects for slow-moving reptiles and species that occupy subsurface burrows. | No direct, indirect or cumulative impacts | Desert tortoise Translocation Plan; Worker awareness program; reduced vehicle speed limits; biological monitors onsite during construction; Weed Management Plan; design avian safe transmission towers. |
| Agriculture | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Cultural Resources | Short-term indirect effects to visual resources from the Old Spanish Trail during construction. No direct, long-term or direct adverse effects. | Short-term indirect effects to visual resources from the Old Spanish Trail during construction. No direct, long-term or direct adverse effects. | No direct, indirect or cumulative impacts | Barricade one site along the transmission line corridor to ensure no impacts result.<br>Stop work if unrecorded cultural resources are discovered |

## Table ES-2 Continued

| **Resource Element** | **Proposed Project Effects** | **Alternative I Effects (Reduced Solar Site / Alternative Transmission ROW)** | **No Action Alternative** | **Mitigation Measures** |
|---|---|---|---|---|
| Socioeconomics | Beneficial short-term and long-term direct and indirect impacts from increased employment, increase in population, increase in local spending, economic stimulus to the Tribe and incremental contribution to cumulative beneficial impacts. | Beneficial short-term and long-term direct and indirect impacts from increased employment, increase in population, increase in local spending, economic stimulus to the Tribe and incremental contribution to cumulative beneficial impacts. Additionally, long-term adverse impacts as less economical stimulus would be produced due to decrease construction size and over energy sales. | Short-term and long-term adverse impacts from no economic stimulus to the Tribe or surrounding community if the Proposed Project were not developed. | No recommendations |
| RESOURCE USE PATTERNS | | | | |
| Utilities | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Airports | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Hunting, Fishing, Gathering | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Grazing Allotments | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Mining | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |

### Table ES-2 Continued

| Resource Element | Proposed Project Effects | Alternative I Effects (Reduced Solar Site / Alternative Transmission ROW) | No Action Alternative | Mitigation Measures |
|---|---|---|---|---|
| Transportation | Short-term direct and indirect impacts due to increased construction workforce traffic and commercial truck traffic; negligible long-term impacts from operational traffic. Negligible cumulative impacts as a result of overall operational traffic. | Short-term direct and indirect impacts due to increased construction workforce traffic and commercial truck traffic; negligible long-term impacts from operational traffic. Negligible cumulative impacts as a result of overall operational traffic. | No direct, indirect or cumulative impacts | Traffic Management Plan during construction; Pre-construction of county access road. |
| Wilderness | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Recreation | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No direct, indirect or cumulative impacts | No recommendations |
| Visual Resources | Negligible short-term and long-term impacts as a result of construction equipment, dust pollution and visible solar arrays. Adverse cumulative impacts if multiple projects are constructed at the same time. | Negligible short-term and long-term impacts as a result of construction equipment, dust pollution and visible solar arrays. Adverse cumulative impacts if multiple projects are constructed at the same time. | No direct, indirect or cumulative impacts | SWPPP to control dust; otherwise no mitigation necessary as VRM tools indicate solar field is barely visible from only few public locations. |
| Public Health and Safety | Minimal potential for onsite and off-site direct and indirect impacts due to handling and storage of hazardous materials; no cumulative impacts due to small amounts of low hazardous materials stored at the facility. Short-term direct and indirect impacts due to increase in disposal of non-hazardous wastes. | Minimal potential for onsite and off-site direct and indirect impacts due to handling and storage of hazardous materials; no cumulative impacts due to small amounts of low hazardous materials stored at the facility. Short-term direct and indirect impacts due to increase in disposal of non-hazardous wastes. | No direct, indirect or cumulative impacts | Hazardous Waste Storage Plan; Spill Prevention and Countermeasure Plan; Health and Safety Programs required for all contractors. |

# 1. Purpose and Need

This chapter describes the purpose of and need for the Proposed Project, discusses the laws, plans, policies, and programs that affect the Proposed Project and this Final Environmental Impact Statement (FEIS), and briefly describes the issues raised during scoping that will be addressed in this FEIS.

## 1.1. Purpose of the Proposed Project

K Road Power (The Applicant) has entered into an agreement with the Moapa Band of Paiutes (Tribe) to lease land, up to 50 years, on the Moapa River Indian Reservation (Reservation) for the purposes of constructing and operating a 350MW PV solar generating station and associated infrastructure (the Proposed Project –see Figure 1-1). The Tribe is federally recognized and has a Constitution approved by the Secretary of the Interior on April 17, 1942. The tribal lands originally set aside in 1874 consisted of two million acres, but in 1876 it was reduced to a thousand acres. In December 1980, 70,000 acres were added. The current total land base is 71,954 acres and is held in trust by the U.S. government for the Moapa Band of Paiute Indians.

The Proposed Project would be located on approximately 2,153 acres of land and have impacts to resources on up to 8,153 acres of land within the Reservation and upon 12 acres of Bureau of Land Management (BLM) land (for a right-of-way). The 2,000 acre solar facility is wholly within the Reservation as well as a proposed 6,000 acre desert tortoise relocation area. An additional 5,000 acres (2,500 acres north and south of the mesa adjacent to Interstate 15 [I-15] and on the Reservation) has also been set aside for potential desert tortoise relocation if needed. The remaining 153 acres is comprised of a high voltage transmission line up to 500 kilovolt (kV), a 16-24 feet wide access road approximately 8 miles long, a approximately 1-mile water pipeline and the approximately 3-mile 12kV transmission line linking the Moapa Travel Plaza (Travel Plaza) on the east side of I-15 to the Proposed Project substation (Figure 1-2) which will facilitate access to the electric grid for the Travel Plaza.

The Proposed Project is dependent upon approval by the Bureau of Indian Affairs (BIA), pursuant to 25 U.S.C. §415, of a solar energy ground lease and associated agreements for transmission lines (500kV, 12kV and water pipeline) and access road Rights of Way (ROW) solely on Reservation land entered into between the Tribe and Applicant (BIA's Proposed Action).

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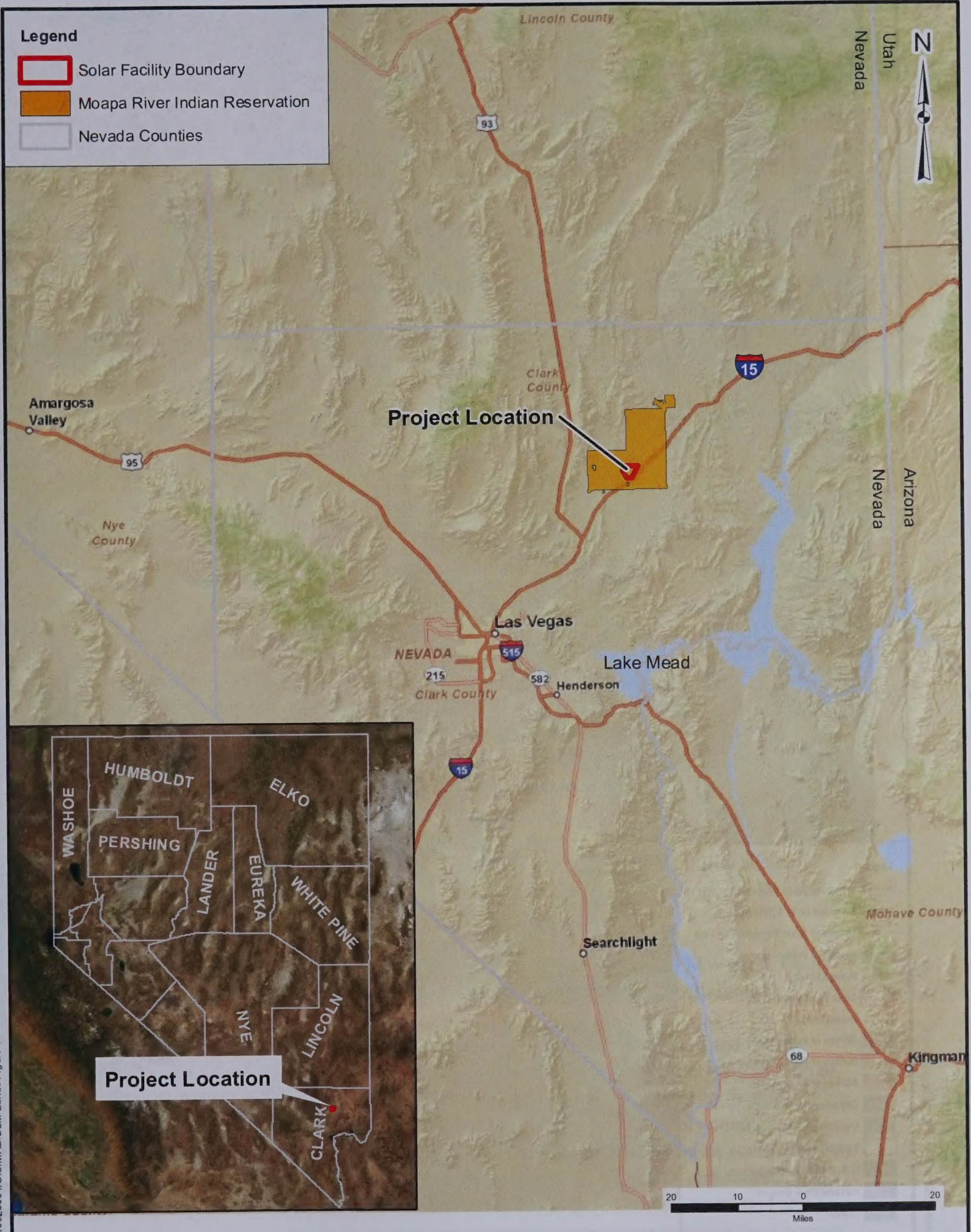
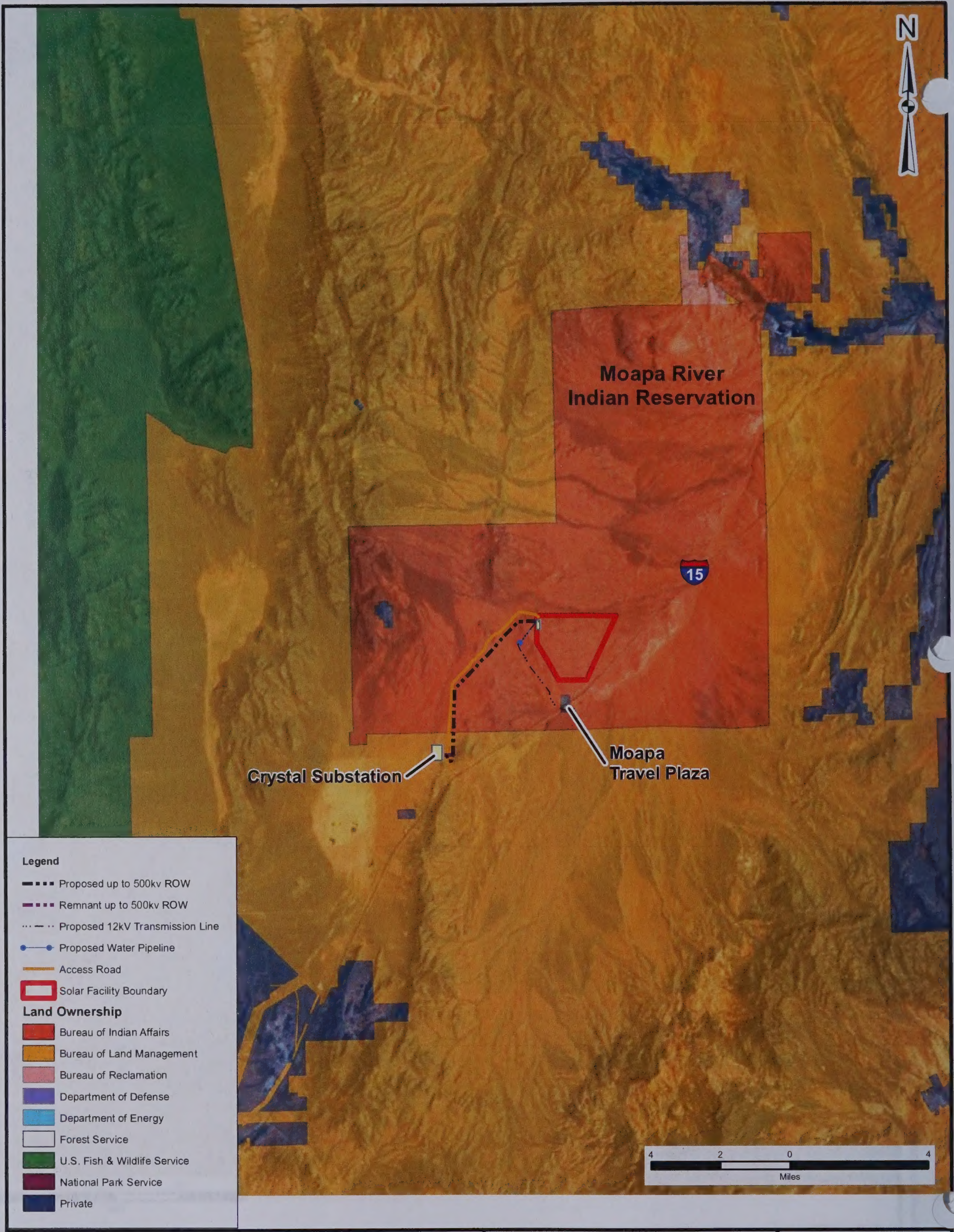


Legend
Solar Facility Boundary
Moapa River Indian Reservation
Nevada Counties
Lincoln County
Nevada
Utah
N
93
Clark County
15
Project Location
Amargosa Valley
95
Nye County
Nevada
Arizona
Las Vegas
NEVADA
515
215
Clark County
582
Henderson
Lake Mead
15
Searchlight
Mohave County
68
Kingman
HUMBOLDT
ELKO
WASHOE
PERSHING
LANDER
EUREKA
WHITE PINE
NYE
LINCOLN
CLARK
Project Location
20
10
0
20
Miles

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

| MALCOLM PIRNIE | K Road Power<br>San Diego, California<br>K Road Moapa Solar Facility | Moapa River Indian Reservation<br>Project Vicinity Map | MALCOLM PIRNIE, INC.<br>November 2011<br>FIGURE 1-1 |
|---|---|---|---|


N
Moapa River
Indian Reservation
15
Crystal Substation
Moapa
Travel Plaza
4 2 0 4
Miles
Legend
Proposed up to 500kv ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Proposed Water Pipeline
Access Road
Solar Facility Boundary
Land Ownership
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Department of Energy
Forest Service
U.S. Fish & Wildlife Service
National Park Service
Private

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Land Ownership Map

MALCOLM PIRNIE, INC.

February 2012

FIGURE 1-2

BLM's purpose and need for the Proposed Project is to respond to the Applicant's application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1761(a)) for rights-of way (ROW) grants to construct, operate, maintain, and decommission an electric transmission and access road ROWs (BLM ROW application NVN-089716), associated with the solar facility on Reservation land in compliance with FLPMA, BLM ROW regulations, and other applicable federal law. The ROW application would include 5.0 miles within an existing utility corridor managed by BLM but located on the Reservation and 0.5 miles of which is located on BLM land just south of the Reservation boundary (BLM Proposed Action). The existing utility corridor is administered by the BLM in accordance with P.L. 96-491 (the Moapa Utility Corridor and the Moapa Act) and reserved to the BLM under Public Law 96-491-Dec. 2, 1980. This ROW is in Township 17 South, Range 64 East, Section 10, and Township 16 South, Range 64 East, Sections 33, 27, 23 and 13 (Figure 1-2). BLM's Proposed Action, if approved, would assist BIA in addressing the management objectives in the Energy Policy Act of 2005 (Title II, Section 211) and Secretarial Order 3285A1 (March 11, 2009) that establishes the development of environmentally responsible renewable energy as a priority for the Department of the Interior. The BLM will decide whether to deny the proposed ROW, grant the ROW, or grant the ROW with modifications. Modifications may include modifying the proposed use or changing the route or location of the proposed ROWs (43 CFR 2805.10(a)(1)).

The construction of the Proposed Project will provide the Tribe with the opportunity to connect its Travel Plaza with the transmission grid via the construction of a 12kV transmission line that will connect directly to the solar facility substation. The proposed BIA action, taken under 25 U.S.C. § 415, is the approval of a solar energy ground lease and associated agreements entered into by the Tribe with the Applicant, and associated approval of ROW and easements on Reservation Land under the management of the Tribe. The proposed BLM action is the approval of a Plan of Development (POD) and issuance of a ROW for the transmission line and upgrade of an existing utility access road within the 4,000-foot wide utility corridor and that portion of the Proposed Project wholly on BLM lands (0.5 miles).

The Proposed Project would be built in three phases of 100 MW to 150 MW each. Each phase would consist of the construction and operation of a solar plant including associated facilities. All associated facilities will be completed during Phase I. The electricity generated from this plant could be sold to the California market and the Nevada market via a Power Purchase Agreement (PPA) with utilities operating in each of those markets. The facility will utilize transformers to step up the voltage to facilitate connection of the facility to the existing 230 kV bus (a rigid power supply conductor to which several connections are made) at Crystal substation, located 0.5 miles south of the Reservation, and/or the similarly located existing 500 kV bus at Crystal substation. The approximately 5.0 mile transmission line and 5.3 miles of the 8.0 mile access road are within a utility corridor on the Reservation, which is managed by BLM (such lands lying within the Mount Diablo Meridian, Nevada, T. 17 S., R. 64 E., sec. 10, and T. 16 S., R. 64 E., sec. 12 thru 14 inclusive, 23, 27 and 33) (Figure 1-2). The ROW is being sought to construct a transmission line to connect the solar generating facility and electric transmission on the Reservation to the Crystal substation and upgrade the existing utility road. Upon exiting the Reservation boundary, the line will continue for 0.5 miles through the aforementioned ROW on BLM land. A water line and a 12kV transmission line are also proposed for the Proposed Project. The approximate 1-mile water line will be constructed on Reservation land and deliver water from an existing Reservation well to the Operation and Maintenance (O&M) building. The 12kV line will connect the Proposed Project substation to the existing Travel Plaza and allow the Tribe to access grid energy and reduce reliance on the existing diesel generators as a source of electricity. The 12kV line would parallel an existing Travel Plaza water line ROW on Reservation land and be constructed after Phase 1 of the solar facility is complete. All permits and applications to cross the Union Pacific railroad and I-15 would be obtained by the Tribe per the lease agreement. Connection of the 12kV line to the Travel Plaza would also be the responsibility of the Tribe.

The Proposed Project is accessible via North Las Vegas Boulevard that parallels I-15 from Exit 64 north approximately 5.80 miles to the end of Nevada Department of Transportation (NDOT) jurisdiction. The access road turns from paved to unimproved paved and becomes the BLM managed access road to Crystal substation. The unimproved utility road traverses north on BLM land within the utility corridor, past the Crystal substation onto Reservation land within the previous mentioned utility corridor.

The subsequent phases would include construction and operation of the remaining solar modules and infrastructure to complete the 350MW Proposed Project.

The BIA has a jurisdictional trust responsibility over Indian lands, and because the Proposed Project is a major Federal action, compliance under the National Environmental Policy Act of 1969 is recommended to evaluate potential impacts and alternatives for project planning and environmental protection. The Tribe, EPA, USACE and the BLM are cooperating agencies on the Proposed Project. The BLM has a custodial administrative trust responsibility over Indian land that applies to the portion of the BLM ROW for utility purposes located on the Reservation. The BIA and BLM will use this FEIS to make a decision.

## 1.2. Need for the Proposed Project

The primary need for the Proposed Project is creating economic development opportunity for the Tribe as well as providing lease income as a revenue source, creating new jobs and employment opportunities for Tribal members, development of sustainable renewable resources, and other benefits to the Tribe, such as connection of the Travel

Plaza to the electric grid, by using the Tribe's solar resources (land with exposure to levels of high solar radiation). Secondly, to assist utilities in meeting their renewable energy goals by providing clean renewable electricity generation from the Tribe's solar resources that may be efficiently connected to existing transmission lines in a manner that minimizes adverse site impacts.

The Tribe identified the solar facility development as meeting its economic development goals, as it would provide much needed revenue to the Tribe, afford employment opportunity, and occupy only a small portion of the Reservation (3 percent).

Prior to the 1800s, the Moapa People were a culturally well–adapted people who combined farming with hunting and gathering. They used the resources of the land with great ingenuity. Most domestic objects of their ancestors were various forms of intricately designed basketry, including water jars, winnowing and parching trays, cradle boards, cooking baskets and seed beaters. They had great skill in the use of animal skins and plants. Their knowledge of nutritional and medicinal uses of plants was extensive (Moapa Paiutes, n.d.).

In 1941 a Constitution and by-laws were created, and the Business Council was established as a governing body for the Tribe. In December 1980, under the Carter Administration, an additional 70,000 acres were provided and held in trust for the Tribe. The stated purpose of the restoration of these lands was to provide economic development opportunities. While the Tribe has been presented with several opportunities to use the restored lands for this purpose, none to date have come to fruition. The current total land base is 71,954 acres.

The Tribe's primary business enterprise centers on the Moapa Paiute Travel Plaza, which includes a small casino, and a convenience store, cafe, gas station, and fireworks store. Further development of this facility has been hampered by an inability to connect to the electric grid. The Proposed Project would solve this problem while providing long-term economic benefit and employment opportunities for the Tribe and its members through a project that is consistent with the Tribe's tradition of respect for the land and fulfills the purposes for which the 70,000 acres were restored to the Tribe by the federal government in 1980 (Moapa Paiutes, n.d.).

The Reservation was selected as the location of the Proposed Project due to its solar resource, the availability of suitable land, transmission accessibility, and absence of land use constraints (i.e., Desert Wildlife Management Areas (DWMAs), Areas of Critical Environmental Concern (ACECs), designated Wilderness Areas, Wilderness Study Areas (WSAs), Land with Wilderness Characteristics (LWC) and other restrictive land use designations).

The site of the Proposed Project would minimize environmental impacts, infrastructure needs, and costs by being located near existing infrastructure, and contribute to the local economy by creating employment opportunities, facilitating connection of the Tribe's travel plaza to the grid, generating lease income for the Tribe, and encouraging expenditures in local businesses.

The Proposed Project would simultaneously further the objectives of the federal government to eliminate or reduce greenhouse gas (GHG) emissions and promote the deployment of renewable energy technologies. In addition, the Proposed Project would help supplement older fossil-fuel electric generating facilities currently affecting the Reservation and replace Travel Plaza generator use with grid power, or interconnected network for delivery electricity to end users, which would contribute to the reduction of GHG emissions.

## 1.3. Summary of Public Scoping and Issue Identification

### 1.3.1. Public Scoping Process

The BIA held two public scoping meetings for the Proposed Project; one held at the Reservation and the other held at the BLM offices located in Las Vegas, Nevada. The scoping report, found in Appendix L, summarizes public comments, provides a preliminary list of issues and/or concerns, and is intended to aid in determining the appropriate scope of environmental analysis from the comments received in response to the scoping meetings. All issues that are substantive and within the scope of the BIA's decisions will be addressed in this FEIS. The issues raised by the public and other agencies during the scoping process are included in Table 1-1:

**Table 1-1:**
**Comments from Public Scoping**

| Agency or Other | Comment |
|---|---|
| EPA (Cooperating Agency) | The U.S. Environmental Protection Agency (EPA) supports the increase in renewable energy resource development, as recommended in the National Energy Policy Act of 2005. Using renewable energy resources, such as solar power, can help the nation meet its energy requirements without generating greenhouse gas emissions. EPA recommends a demonstration center at the Travel Plaza so that tourists can learn about solar power and benefits.<br>Our main interest is that impacts to ephemeral streams (desert washes) be minimized because of the water quality and habitat benefits these resources provide. |
| EPA | Consistent with 40 CFR § 1502.14(f), EPA recommends an alternative be developed having a project configuration that avoids impacts to ephemeral drainages or desert washes to the maximum extent possible. |

**Table 1-1 Continued**

| Agency or Other | Comment |
|---|---|
| EPA | Efforts to preserve vegetation and habitat should be pursued. In arid areas, disturbed vegetation is slow to recover. It may be possible to mount PV panels at sufficient height above ground to maintain natural vegetation and drainage. Practices that preserve habitat, minimize weed invasion, and prevent erosion should be incorporated into the project. |
| EPA | There are currently many solar energy projects being proposed on Bureau of Land Management (BLM) land in the desert southwest. The analysis of cumulative impacts should consider these other projects, in addition to other developments in the area and general resource trends, on the resources that would be affected by the proposed project. As mentioned, cumulative impacts to desert washes and ecosystems are occurring and will continue to occur from multiple large solar installations in the desert; therefore, cumulative impacts to this resource should be thoroughly discussed for this project. We also recommend thorough discussions of cumulative impacts to water resources and the desert tortoise. |
| Center for Biological Diversity | Impacts on desert tortoise. The desert tortoise is protected as Threatened under the Endangered Species Act. The desert tortoise is continuing to decline throughout its range despite being under federal and state Endangered Species Acts protection as threatened. The project area lies in the Northeastern Mojave Recovery Unit for the desert tortoise, within potential occupied habitat, and outside of areas designated as critical habitat. Typically, as part of the preparation of the site for solar energy development, mass grading and leveling would be required, that would destroy tortoise habitat and render it unsuitable in perpetuity. Even if mass grading were not done, the habitat would be significantly degraded. |
| Center for Biological Diversity | The Scientific Advisory Committee (SAC) of the U.S. Fish and Wildlife Service's Desert Tortoise Recovery Office has recently concluded that "translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option. When considered, translocation should be part of a strategic population augmentation program, targeted toward depleted populations in areas containing "good" habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of "depleted" (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified. Augmentations may also be useful to increase less depleted populations if the goal is to obtain a better demographic structure for long-term population persistence. Therefore, any translocations must be accompanied by specific monitoring or research to study the effectiveness or success of the translocation relative to changes in land use, management, or environmental condition. Translocation should be used as a tool to augment populations within depleted recovery units, not as a mitigation strategy to allow for development in desert tortoise habitat. |
| Center for Biological Diversity | There are at least two rare plant species of potential concern, the threecorner milkvetch (*Astragalus geyeri)* and the Las Vegas bearpoppy (*Arctomecon californica)*. Both are state listed under NRS 5427.260 as critically endangered and are BLM special status species. They are also considered by the Nevada Native Plant Society as meeting the federal definition for listing under the Endangered Species Act.<br>At least two years of plant surveys should be conducted to confirm the absence of the species and if found to be present, protective measures should be established to avoid, minimize and mitigate impacts. |
| Kern River Gas Transmission Company | To not interfere with the existing gas line: construct transmission line so that conductors do not overhang into Kern River ROW; access road should cross the pipeline ROW at a 90 degree angle, the crossing should be padded; use "One Call" before construction; determine if alternating current interference will result from project; complete an encroachment permit between Applicant and Kern River; Kern River will have a technician on site during construction. |

## 1.4. Policies and Programs

### 1.4.1. Relationship to Federal Policies, Plans, and Programs

The Proposed Project may need to conform to some or all of the laws, regulations or policies shown in Table 1-2. Additional details and summation of federal, Tribal, state, and local policies, plans, and laws that may apply to the Proposed Project are found in Appendix A. It should be noted that the portion of the Proposed Project wholly within the Reservation would be regulated under the Tribe's Environmental Policy Ordinance, in accordance with NEPA, and in compliance with other federal actions that apply on tribal lands only. Further, the portion of the Proposed Project that is on the Reservation and within the BLM managed utility corridor as well as only on BLM land may be regulated under county, state, and federal action that apply to the BLM. The below synopsis of local, state and federal laws regulations and executive laws is meant to be all encompassing for the entire Proposed Project.

**Table 1-2.**
**Environmental Laws, Regulations, and Policies**

| Law | Record |
|---|---|
| **GENERAL** | |
| National Environmental Policy Act (NEPA) | 42 U.S.C. 4321 et seq. |
| Administrative Procedures Act | 5 U.S.C. 701-706 |
| Moapa Band of Paiutes Tribal Environmental Policy Ordinance | Tribal Document 12708\2\1398527.3 |
| Bureau of Indian Affairs (BIA) NEPA Handbook | 59 Indian Affairs Manual (IAM 3-H) (2005) |
| NEPA, Protection and Enhancement of Environmental Quality | Executive Order 11514 |
| Department of Energy Organization Act | 42 U.S.C. 7101 |
| Consultation and Coordination with Indian Tribal Governments | Executive Order 13175 |
| Authority for BIA to approve business leases on tribal trust lands implementing regulations | 25 U.S.C. 415<br>25 CFR 162 |
| **AIR QUALITY AND CLIMATE** | |
| Clean Air Act (CAA) | 42 U.S.C. 7401 et seq. |
| NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions | Council on Environmental Quality (CEQ), February 18, 2010 |
| Air pollution control program: Clark County Department of Air Quality and Environmental Management | Nevada Revised Statute (NRS) 445B.500 |

**Table 1-2 Continued**

| Law | Record |
|---|---|
| **SOILS** | |
| Farmland Protection Policy Act | 7 U.S.C. 4201, et seq. |
| **WATER RESOURCES** | |
| Clean Water Act (CWA) Sections 401, 402 and 404 | 33 U.S.C. 1251 et seq. |
| Safe Drinking Water Act | 42 U.S.C. 300f et seq. |
| Nevada State Surface Water Quality | Nevada Administrative Code 445A.118-225 |
| Floodplain Management | Executive Order 11988 |
| Protection of Wetlands | Executive Order 11990 |
| **CULTURAL AND HISTORICAL** | |
| National Historic Preservation Act | 16 U.S.C. 470 et seq.; Executive Order 11593 |
| Archaeological Resources Protection Act | 16 U.S.C. 470aa-470ll |
| Archaeological and Historic Preservation Act | 16 U.S.C. 469 et seq. |
| American Indian Religious Freedom Act | 42 U.S.C. 1996 et seq. |
| Indian Sacred Sites | Executive Order 13007 |
| Native American Graves Protection and Repatriation Act | 25 U.S.C. 3001 |
| Antiquities Act | 16 U.S.C. 431 et seq. |
| Paleontological Resources Preservation Act | Subtitle D of the Omnibus Public Land Management Act of 2009, Pub. L. 111-011 |
| **BIOLOGICAL RESOURCES** | |
| Endangered Species Act | 16 U.S.C. 1531-1543 |
| Fish and Wildlife Conservation Act | 16 U.S.C. 2901 |
| Fish and Wildlife Coordination Act | 16 U.S.C. 661, 48 Stat. 401 as amended |
| Migratory Bird Treaty Act | 16 U.S.C. 703 et seq. |
| Bald and Golden Eagle Protection Act of 1940, as amended | 16 U.S.C. 668 |
| Public Lands - Wild Horses and Burros | 85 Stat. 649, enacted by Pub.L.No.92-195 |
| Invasive Plants and Noxious Weeds | Executive Order 13112 |
| Nevada State Protected Species | Nevada Revised Statute 527.060–527.120 |

**Table 1-2 Continued**

| Law | Record |
|---|---|
| **LAND USE LAWS** | |
| Enforcement of State Wildlife Resources | Nevada Revised Statute 501 |
| Clark County Comprehensive Plan | Clark County's Utilities Policy UT 1-6 |
| Las Vegas Resource Management Plan | BLM Document: BLM/LV/LP-99/002+1610 |
| **NOISE** | |
| Noise Control Act | 42 U.S.C. 4901-4918 |
| Clark County Noise Ordinance | Sec 30.68.020 (h) & (e) |
| Federal Aviation Administration | 14 CFR Part 77 |
| **SOCIAL/ECONOMIC** | |
| Environmental Justice | Executive Order 12898 |
| Limited English Proficiency (LEP) | Executive Order 13166 |
| **MANAGEMENT AREA** | |
| National Wildlife Refuge System Administration Act | 16 U.S.C. 668dd |
| **HUMAN HEALTH AND HAZARDOUS MATERIALS** | |
| Hazardous Waste and Solid Waste Amendments Act | 42 U.S.C. 6901 |
| Federal Compliance with Pollution Control Standards | Executive Order 12088 |
| Superfund Implementation | Executive Order 12580 |
| Occupational Safety and Health Act | 29 U.S.C. 657 et seq. |
| Comprehensive Environmental Response, Compensation and Liability Act | 42 U.S.C. 9601 |
| Federal Insecticide, Fungicide, and Rodenticide Act | 7 U.S.C. 136 |
| Toxic Substances Control Act | 15 U.S.C. 2601 et seq. |
| Pollution Prevention (Right to Know) | Executive Order 12856 |
| Clark County Fire Department | Ord. 2762 (part), 2002; Ord. 1881 §1 (part), 1996 |

## 1.5. Permits and Approvals Required for the Proposed Project

Table 1-3 lists the anticipated local, Tribal, state, federal and private permits or approvals that may be required for the Proposed Project. Due to the Proposed Project impacting both tribal and federal lands, Table 1-3 has been divided accordingly.

## Table 1-3.
## Anticipated Permits for the Proposed Project

| Land Ownership | Solar Field | Transmission Line(s) / Water Line | Access Road |
|---|---|---|---|
| Moapa River Indian Reservation | NPDES 402 Construction Stormwater Permit (EPA) | NPDES 402 Construction Stormwater Permit (EPA) | NPDES 402 Construction Stormwater Permit (EPA) |
| | Section 7 Consultation (USFWS) | Section 7 Consultation (USFWS) | Section 7 Consultation (USFWS) |
| | Section 106 Consultation (SHPO) | Section 106 Consultation (SHPO) | Section 106 Consultation (SHPO) |
| | | Permits and or Application for crossing the UP Railroad and Interstate 15 (NDOT) with the 12kV line. | |
| BLM (utility corridor) | N/A | Section 404 Permit (USACE) | Section 404 Permit (USACE) |
| | N/A | Plan of Development (BLM) | Plan of Development (BLM) |
| | N/A | Section 7 Consultation (USFWS) | Section 7 Consultation (USFWS) |
| | N/A | NPDES 402 Construction Stormwater Permit | NPDES 402 Construction Stormwater Permit |
| | N/A | 401 Water Quality Certification (EPA) | 401 Water Quality Certification (EPA) |
| | N/A | Section 106 Consultation (SHPO) | Section 106 Consultation (SHPO) |
| | N/A | Clark County Air Pollution Control Program | Clark County Air Pollution Control Program |
| | N/A | Encroachment Permit with Kern River Gas Transmission Company | Encroachment Permit with Kern River Gas Transmission Company |
| | N/A | Special Purpose Permit for Desert Tortoise relocation (NDOW) | Special Purpose Permit for Desert Tortoise relocation (NDOW) |
| NV Energy -Crystal Substation | N/A | Interconnection Agreement | N/A |

Note: State and county approvals only on BLM lands or BLM managed lands; Tribal approval of lease and associated agreements on Tribal lands only.

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# 2. Alternatives

## 2.1. Introduction

This section describes the Proposed Project elements from construction, operations and maintenance, to decommissioning. This section describes the No Action Alternative, The Proposed Action Alternative, a second alternative and several alternatives considered by the Applicant, the Tribe, and the BIA, but eliminated from further analysis and consideration. The rationale for dismissing other alternatives to the Proposed Project is also discussed.

The Proposed Project is dependent upon approval by the BIA of a solar energy ground lease and approval by the BLM for access road and transmission line ROWs and associated agreements entered into by the Tribe and BIA with the Applicant to construct and operate a solar photovoltaic electricity generating facility located entirely on Tribal lands. The ground lease will enable the Applicant to construct and operate an up to 350MW-solar photovoltaic electricity generating facility at a specific location on approximately 2,153 acres of tribal lands held in trust by the United States and located on the Reservation in Clark County, Nevada. The facility will utilize transformers to step up the voltage to interconnection voltage to facilitate a connection of the facility to one or more of the following: the existing 230kV or 500kV bus at Crystal substation located on BLM land, one half mile south of the Reservation. The proposed facility would provide a 12kV transmission line to the Travel Plaza. The 12kV line will be connected to the solar facility sub-station step-up transformer and run parallel to an existing unimproved road (existing Travel Plaza water line ROW) approximately 3 miles west and south of the site.

The proposal would require BLM approval of a ROW across approximately 5.50 miles of a BLM managed utility corridor within the Mount Diablo Meridian, Nevada, T. 17 S., R. 64 E., sec. 10, and T. 16 S., R. 64 E., sec. 12 thru 14 inclusive, 23, 27 and 33 to construct a transmission line and upgrade the existing access road to connect the solar facility and electric transmission on the Reservation to the Crystal substation. Of the approximately 5.0 miles (91 acres), only 0.5 miles (9 acres) is outside of the Reservation boundary and wholly within BLM managed lands (T17, R64E, Section 10).

## 2.2. Photovoltaic Technology Background

Photovoltaics is the field of technology and research related to devices that directly convert sunlight into electricity. The solar cell is the elementary building block of the photovoltaic technology. Solar cells are made of semiconductor materials, such as silicon.

There are several types of solar cells. However, more than 90 percent of the solar cells currently made worldwide consist of wafer-based silicon cells. They are either cut from a single crystal rod or from a block composed of many crystals and are correspondingly called mono-crystalline or multi-crystalline silicon solar cells. Wafer-based silicon solar cells are approximately 200 micrometers (μm) thick. Another important family of solar cells is based on thin-films, which are approximately 1-2 μm thick and therefore require significantly less active, semiconducting material. Thin-film solar cells can be manufactured at lower cost in large production quantities. However, they have lower efficiencies than wafer-based silicon solar cells, which means that more surface exposure and material is required for the installation to achieve similar performance.

A number of solar cells electrically connected to each other and mounted in a single support structure or frame is called a ‘photovoltaic module’. Modules are designed to supply electricity at a certain voltage, such as a common 12 volt system. The current produced is directly dependent on the intensity of light reaching the module.

Several modules can be wired together to form an array. Photovoltaic modules and arrays produce direct-current electricity. They can be connected in both series and parallel electrical arrangements to produce any required voltage and current combination.

There are two main types of photovoltaic system: grid and off grid. Grid-connected systems (on-grid systems) are connected to the grid and inject the electricity into the grid. For this reason, the direct current produced by the solar modules is converted into a grid-compatible alternating current. However, solar power plants can also be operated without the grid and are then called autonomous systems (off-grid systems). More than 90 percent of photovoltaic systems worldwide are currently implemented as grid-connected systems (European Commission 2009).

## 2.3. Description of the Proposed Alternatives

### 2.3.1. Alternatives Development

This section outlines the process used by the BIA, cooperating agencies, and the Applicant to develop reasonable alternatives to the Proposed Project. Alternatives considered by the Tribe, Applicant and the BIA, along with those suggested by the public during the scoping process, were evaluated using the following criteria:

- Does the alternative fulfill the project’s purpose and need as outlined in Chapter 1?
- Does the alternative minimize impacts to human and environmental resources?
- Is the alternative technically and/or economically feasible to construct, operate, maintain, and decommission?

### 2.3.2. Alternatives Considered and Carried Forward for Detailed Analysis

This section describes the Proposed Project and an alternative that includes a reduced size build-out and alternative transmission line route (Alternative I) within the Reservation which meets the purpose and need. A No Action Alternative is also described. The Proposed Project's features and construction methods detailed in this section serve as the basis of the environmental impact analysis in Chapter 4, Environmental Consequences.

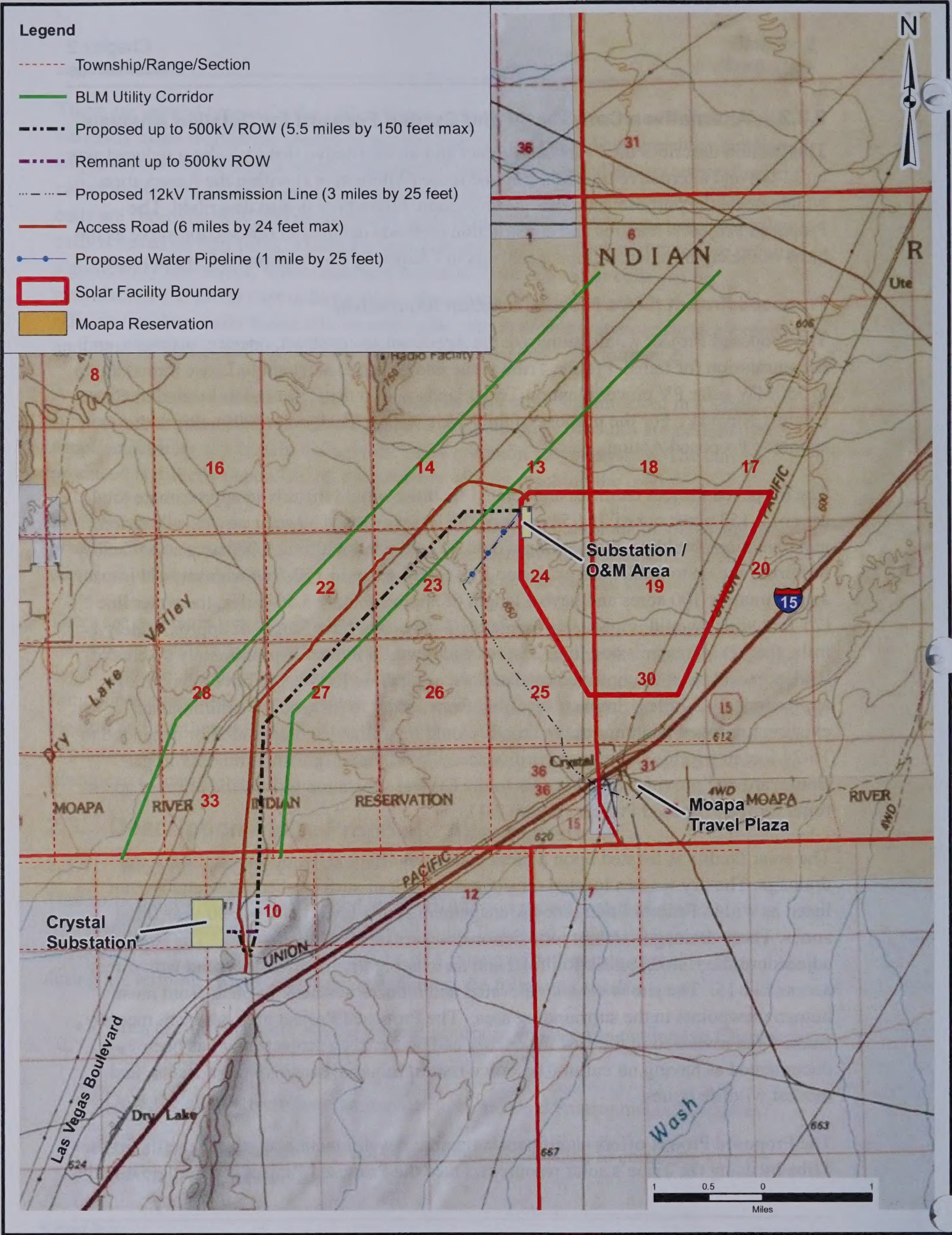
#### Proposed Project (BIA's Proposed Action Alternative)

The Proposed Project would authorize the Applicant to construct, operate, maintain, and decommission (or transfer to the Tribe at the end of lease, pursuant to Lease terms) an up to 350MW solar PV power plant on Tribal lands within the Reservation located in Clark County, Nevada. For the purpose of the BIA's NEPA handbook (2005), this is the agency's Proposed Action.

The Proposed Project facilities and related facilities would disturb an approximate total area of 2,153 acres out of 71,954 acres of the Reservation. The solar arrays, substation, and operations building and parking would be contained within a 2,000 acre solar facility footprint; the up to 500kV transmission line corridor (up to 150-foot wide) would impact approximately 100 acres and have a length of approximately 5.50-miles; the water line (25-foot wide) would impact approximately 3 acres and have length of approximately 1-mile; the 12kV transmission line (25-foot wide) would impact approximately 9 acres of land, adjacent to an unimproved road and water pipeline ROW, and have a length of approximately 3-miles. Impacts resulting from access roads would be minimal as existing improved and unimproved roads would be utilized and upgraded or expanded to 16-24 feet in width. The existing utility access road that originates from Las Vegas Boulevard and provides direct access to the Crystal substation will be the primary access route for the Proposed Project (Figure 2-1).

The solar facility is located upon a mesa and is not affected by mountain stormwater drainage. The dry washes located on site are a result of surface sheet flow and are not listed as within Federal Emergency Management Act (FEMA) 100 or 500 year flood zones. These drainages are not jurisdictional waters of the United States. The site is adjacent to the Union Pacific Railroad and an existing improved access road with direct access to I-15. The site is visually elevated and reduces aesthetic impacts from most human viewpoints in the surrounding area. The Proposed Project area has been recently studied and reviewed in the past for energy and non-energy projects and has been documented as having no cultural resource issues, minimal sensitive plant issues, and modest wildlife issues.

The Proposed Project offers significant economic development and other benefits for the Tribe by using the Tribe's solar resources. Once the Proposed Project is complete it will


Legend
Township/Range/Section
BLM Utility Corridor
Proposed up to 500kV ROW (5.5 miles by 150 feet max)
Remnant up to 500kv ROW
Proposed 12kV Transmission Line (3 miles by 25 feet)
Access Road (6 miles by 24 feet max)
Proposed Water Pipeline (1 mile by 25 feet)
Solar Facility Boundary
Moapa Reservation
N
INDIAN
R
Ute
36
31
1
6
8
16
14
13
18
17
PACIFIC
Substation / O&M Area
22
23
24
19
20
15
UNION
Dry Lake Valley
28
27
26
25
30
Crystal
36
31
36
MOAPA
RIVER
33
INDIAN
RESERVATION
4WD
MOAPA
RIVER
Moapa Travel Plaza
PACIFIC
12
7
10
Crystal Substation
UNION
Las Vegas Boulevard
Dry Lake
Wash
1
0.5
0
1
Miles

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Proposed Project

MALCOLM PIRNIE, INC.

February 2012

FIGURE 2-1

Map Document: Austin/6923001/GIS/MXD/BLM Lands Figure 1 generate substantial lease income for the Tribe over an approximately 35-year period. The Tribe will have an option to purchase, own, and operate the project and, as situated, creates an opportunity to bring utility grid power to the Tribe for future use as stated below:

- The Proposed Project site is in close proximity to the Tribe's Travel Plaza. The development of a utility scale power project in proximity to the Travel Plaza would enable the supply of reliable utility grade electric power to the Travel Plaza by accessing the Proposed Project's interconnection with the grid.
- Without access to the utility grid, the Travel Plaza has had to run on-site diesel engines to generate electricity, which produces air emissions and limits further development.
- The Proposed Project will establish an opportunity for utility connection along with added economic and employment benefits for the Tribe by supporting further development of their Travel Plaza.

The Proposed Project does not interfere with day-to-day tribal life and does not interfere with the Tribe's plans for other economic development initiatives. The economic benefits would accrue to the Tribe once the Proposed Project is completed. The Proposed Project is designed to have a high likelihood of completion. Features of the Proposed Project that enhance this likelihood are:

- **Use of most-proven solar technology** for long-term, reliable power generation. Power purchase agreements for solar projects typically run 20 years or longer. Technology with a proven track record of reliability and a known performance history are critical. Photovoltaics technology has the longest track record in the field with several utility scale projects currently in operation throughout the global market.
- **Financeability.** The Applicant wants to develop a project that does not rely entirely on uncertain government subsidies. Based on discussions with financial advisors, the Proposed Project sponsors believe that PV is the solar technology with the best chance to attract private market debt financing. Advice was that the rating agencies view PV as "proven technology."
- **Suitable Terrain.** Terrain on the chosen site was relatively flat and could accommodate fixed tilt and solar panels with trackers, which increase output of solar power per square foot.
- **Sufficient Project Scale.** The Proposed Project has sufficient scale to be competitive in the market for solar power, to accommodate substantial non-scalable fixed costs, and to attract the interest of private capital providers, including non-government lenders.
- **Proximity to Existing Transport Infrastructure.** The Proposed Project is located conveniently to major roadways to support transport of construction materials and life-of-project site access while minimizing need for additional

roads on the Reservation. Site location will produce minimal vehicle emission impacts due to reduced travel distances for project access and deliveries.

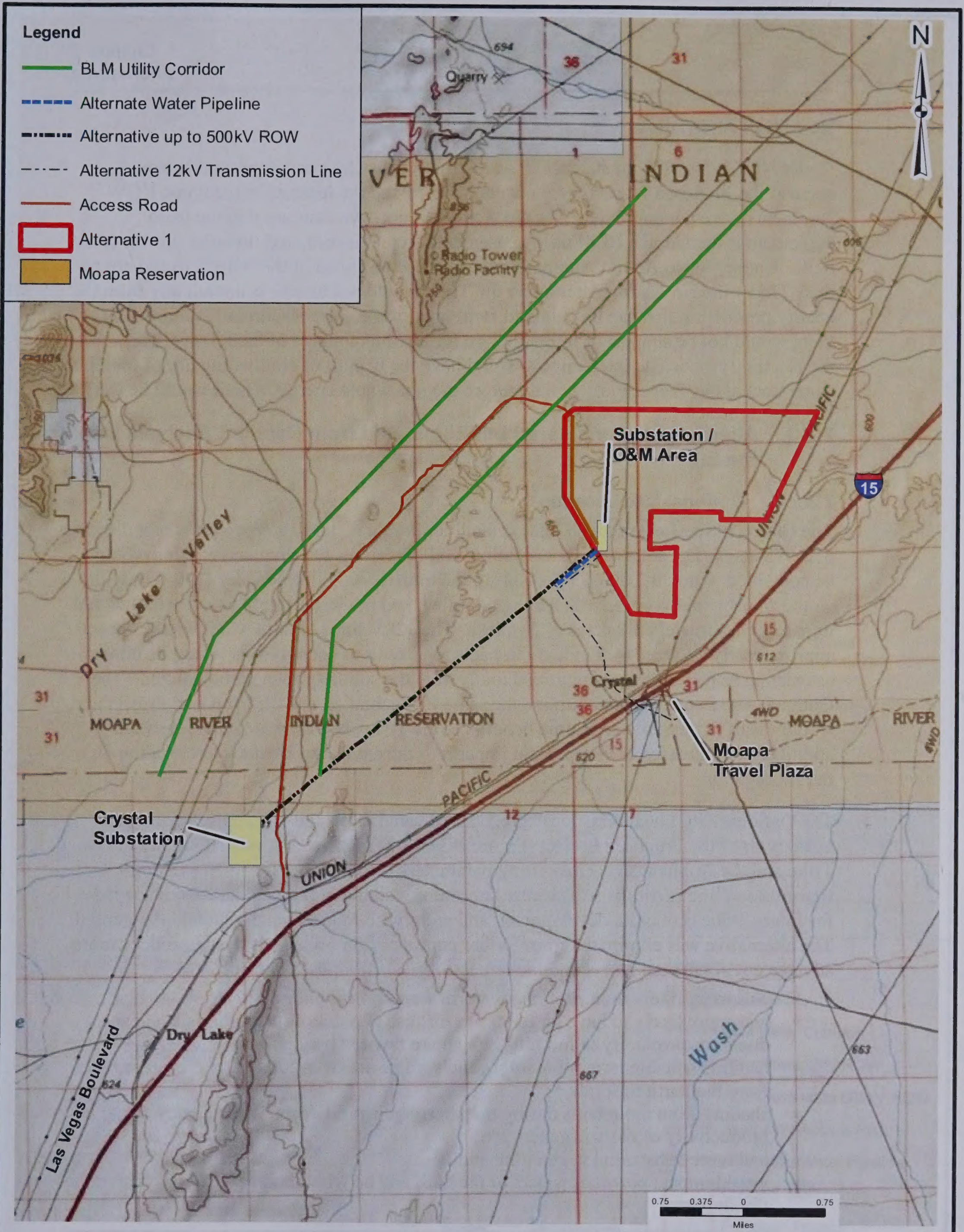
The Proposed Project assists utilities in meeting their renewable energy goals by providing clean renewable electricity generation from the solar resources. The project scale, technology, and site have been selected to provide substantial amounts of renewable energy to regional utility customers that reside in areas that are not suitable for solar development. The Proposed Project is designed to provide solar power to utilities at a price that is competitive with other renewable sources of power. Additionally the dependence upon diesel generators at the Travel Plaza would be eliminated.

The Proposed Project location allows efficient connection of the energy from solar resources to existing transmission infrastructure. The selected site is positioned well to minimize further use and impact to additional land needed for transmission generation to tie into the existing transmission infrastructure, including the Crystal substation. The selected site is adjacent to an existing transmission corridor that has a direct path to the Crystal substation. The Crystal substation itself lies within 5.50 miles of the project's northwest boundary. Existing transmission lines from the Crystal substation extend to highly populated areas. The nearby existing transmission infrastructure has available capacity to carry the project's output to market (K Road, Personal communication, February 2011).

The Proposed Project location and proposed PV technology will minimize adverse site impacts. The chosen PV panels typically sit 4 to 7 feet off the ground and are not very visible from a distance. The proposed PV technology minimizes use of water resources. PV consumes no water in operations and uses insignificant amounts of water for cleaning modules, which occurs approximately 2 to 4 times per year. The proposed PV technology has relatively few moving parts and, therefore, does not create a noticeable noise impact.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

The Proposed Project is designed to be constructed in three phases consisting of 100MW to 150MW sections within the solar facility boundary. The reduced solar facility footprint alternative would only complete Phases 1 and 2 and impact approximately 1,400 acres of land and produce 250MW of solar electricity. This alternative would also utilize an alternative corridor for the up to 500kV transmission line ROW. The alternative ROW would be a direct route to the existing Crystal substation and impact less overall acreage for construction (Figure 2-2); however, it would traverse an open area of the desert outside of the existing utility corridor. This alternative was found to yield environmental impacts similar to the Proposed Project.


Legend
🟩 BLM Utility Corridor
Alternate Water Pipeline
Alternative up to 500kV ROW
Alternative 12kV Transmission Line
Access Road
🟥 Alternative 1
🟧 Moapa Reservation
N
Quarry
Radio Tower
Radio Facility
INDIAN
Substation / O&M Area
15
Dry Lake Valley
MOAPA RIVER INDIAN RESERVATION
Crystal
Moapa Travel Plaza
MOAPA RIVER
4WD
PACIFIC
UNION
Crystal Substation
Dry Lake
Las Vegas Boulevard
Wash
0.75 0.375 0 0.75
Miles

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Alternative I

MALCOLM PIRNIE, INC.

September 2011

FIGURE 2-2

### No Action Alternative

Under NEPA, the BIA must consider an alternative that assesses impacts that would occur if the Proposed Project were not constructed and the lease agreement and ROW easements were not approved. The No Action Alternative assumes that the lease agreement is denied, the BLM utility easements are not issued, and the solar project is not built. Under the No Action Alternative the purpose and need of the project would not be met. Under the No Action Alternative the Tribe would not benefit economically from the energy production that can be obtained from their prime solar resources. Additionally, there would not be support or infrastructure for the interconnect of their Travel Plaza to the electricity grid. The interconnect would have the benefit of eliminating use of diesel generators at the Travel Plaza and therefore the renewable energy benefit would be lost.

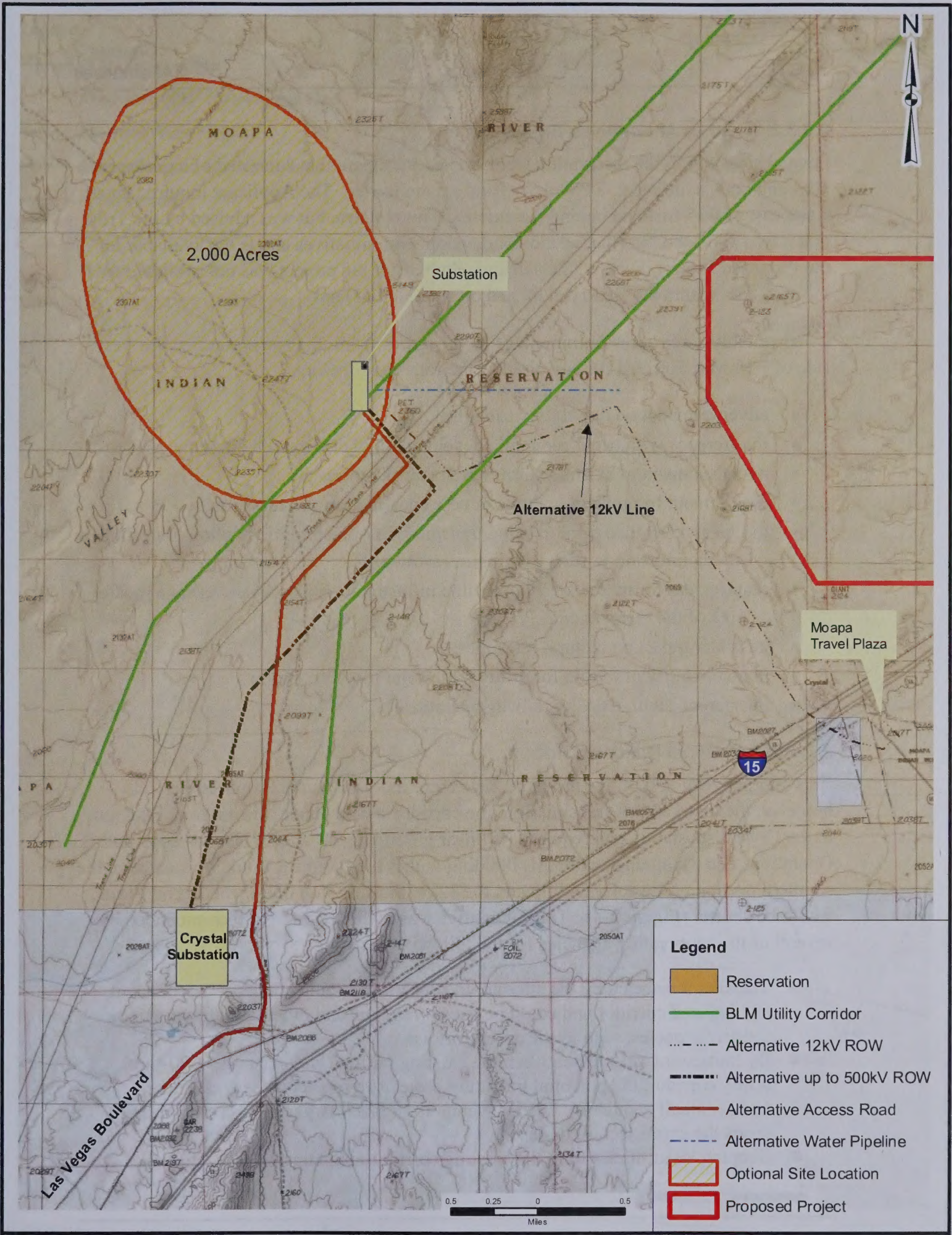
## 2.3.3. Alternatives Considered but Eliminated from Detailed Analysis in the EIS

### 2.3.3.1. Optional Site Location

The Optional Site Location and related facilities would disturb an approximate total area of 2,078 acres. The solar arrays, substation, and operations building and parking would be contained within a 2,000 acre footprint; the transmission line corridor (150-foot wide) would impact approximately 62 acres (3.4 miles) and the water line (25-foot wide) would impact approximately 3.0 acres (1.5 miles). The 12kV line (25-foot wide) would impact approximately 12 acres (4.3 miles). Impacts as a result of access roads would be minimal as existing improved and unimproved roads from the southwest would be utilized. The Optional Site Location would utilize the same PV technology as the Proposed Project and would result in the same economic benefits to the Tribe; however, it could constitute additional or increased environmental impacts to the environment due to its location on the Reservation.

The Optional Site Location is located off the elevated mesa and lies approximately 2 miles west of the Proposed Project (Figure 2-3). The Optional Site was chosen by the Tribe and the Applicant. Facility siting parameters included: proximity to existing transmission line corridors and electric substation, relatively flat land, areas not scoped for future Tribe economic development, and areas with reliable solar generation potential. The alternative was eliminated from further consideration because it would produce more adverse environmental and economic impacts than the proposed site such as:

- was more likely to impact major storm water runoff paths;
- was more likely to have larger desert tortoise populations than the selected site due to its proximity to foothills, which are favored by tortoises;
- had less suitable terrain for solar panels; there are over 200 feet of elevation relief from the north to south;
- shading from mountains during the afternoon would decrease efficiency and productivity of electric generation;
- had more substantial vegetation; and
- would impact potential waters of the U.S. and be within the FEMA 100-year floodplain.


N
MOAPA
RIVER
INDIAN
RESERVATION
VALLEY
2,000 Acres
Substation
Alternative 12kV Line
Moapa Travel Plaza
15
Crystal Substation
Las Vegas Boulevard
0.5 0.25 0 0.5
Miles
Legend
🟧 Reservation
BLM Utility Corridor
Alternative 12kV ROW
Alternative up to 500kV ROW
Alternative Access Road
Alternative Water Pipeline
▨ Optional Site Location
🟥 Proposed Project

| MALCOLM PIRNIE | K Road Power<br>San Diego, California<br>K Road Moapa Solar Facility | Moapa River Indian Reservation<br>Optional Site Location | MALCOLM PIRNIE, INC.<br>September 2011<br>FIGURE 2-3 |
|---|---|---|---|

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

### 2.3.3.2. Other Alternatives Eliminated

Several sites within the reservation were studied by a team that consisted of a geologist, a civil engineer, a biologist, a PV expert, and a team leader. The Applicant inquired about a site east of I-15 east and behind the existing Travel Plaza, but was advised by the Tribe that it was allocated for other economic development initiatives and is not available for the Proposed Project. Further, the acreage required for the project was not available on the east side, within the Reservation, and on suitable flat land.

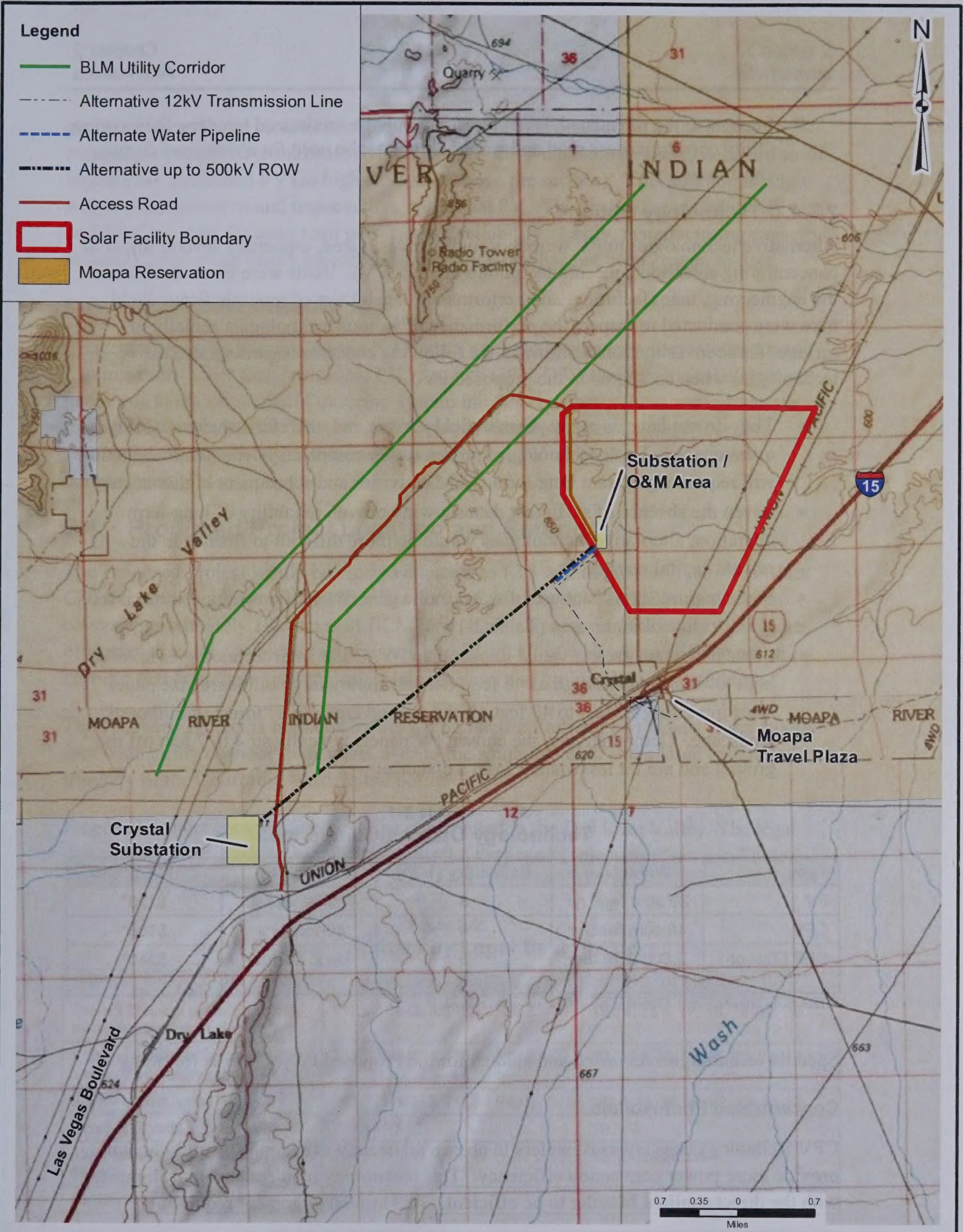
Other suitably-sized areas (minimum of 2,000 acres) within the reservation on the west side of I-15 were rejected for any or all of the following reasons:

- adverse impact on day-to-day tribal life;
- interference with tribal economic development plans for such areas;
- adverse impact to existing storm water runoff patterns;
- requirement for greater amounts of new construction of access roads;
- too great a distance from existing transmission infrastructure to allow for efficient interconnection to such existing infrastructure;
- requirement for more extensive tie line infrastructure, thereby covering a greater area of the reservation;
- possible impact on cultural resources;
- non-suitability of terrain for utility scale solar projects; and/or
- interference with existing railway operations.

### 2.3.3.3. Optional Utility Corridor

This alternative would utilize the same 2,000 acre footprint as the Proposed Project; however, the up to 500kV transmission line corridor would connect in a more direct route to the Crystal substation and require less linear ground disturbance. The substation and Operations and Maintenance (O&M) building within the footprint would be located in the southern portion of the solar facility and the 12kV transmission line to the Travel Plaza would be shorter (Figure 2-4). This alternative was reviewed and not recommended by several of the cooperating agencies for the following reasons:

- The area transected by the alternative 500kV line would create an independent and isolated corridor and could be used by raptors and other birds to prey upon sensitive species, such as the desert tortoise.
- By transecting the area between the existing railroad and existing 4,000-foot utility corridor, the potential for future projects to impact these areas increases and eventually could provide an avenue for a much larger utility corridor that spans the entire section of desert.
- Keeping all utilities within the existing corridor maintains visual aesthetics.


Legend
BLM Utility Corridor
Alternative 12kV Transmission Line
Alternate Water Pipeline
Alternative up to 500kV ROW
Access Road
Solar Facility Boundary
Moapa Reservation
N
Quarry
694
36
31
1
6
VER
INDIAN
856
Radio Tower
Radio Facility
750
606
PACIFIC
UNION
Substation / O&M Area
15
650
Dry Lake Valley
MOAPA RIVER INDIAN RESERVATION
MOAPA RIVER
612
Crystal
36
31
4WD
Moapa Travel Plaza
620
PACIFIC
12
7
Crystal Substation
UNION
Las Vegas Boulevard
Dry Lake
624
667
Wash
663
0.7 0.35 0 0.7
Miles

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Optional Utility Corridor

MALCOLM PIRNIE, INC.

September 2011

FIGURE 2-4

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

- Impacts to the threatened desert tortoise would be minimized by using the existing utility corridor access road and would eliminate the need for a new road during construction.

### 2.3.4. Technology Options

Alternative technologies to PV were thoroughly investigated, especially several forms of concentrating solar and concentrated photovoltaic (CPV). Visits were made to observe the engineering, manufacturing, and performance capabilities of multiple firms. Field trips were conducted to inspect the performance of various technologies actually in service. These investigations confirmed the following concerns regarding alternative technologies when compared to the proposed PV:

- They do not have as many years in field service and, therefore, their reliability is questionable. These technologies possess more complex system components that will require significant long-term O&M activities and subsequent higher costs.
- Given the absence of sufficient data showing proven reliability of long-term operation, alternative technologies would be more difficult to finance in the private capital markets.
- Some require significant use of water in the generation of power and water is a scarce resource in the area (Table 2-1).
- Some had much greater visual impact than PV. Other solar technologies involve high towers, some as high as 40 feet. Others employ large billboard size panel apertures rising 15 feet to 40 feet off the ground creating a "forest of billboard" landscape. Comparatively, the chosen PV panels typically sit 4 to 7 feet off the ground and are far less visible from a distance.

**Table 2-1.**
**Technology Options Comparison**

| Type | Water Use | Reliability (1-10) | Visibility | Cost per MW |
|---|---|---|---|---|
| PV | 20 acre feet /yr | 8 | 4 to 7-foot high | $120* |
| CPV | 40 acre feet /yr | 4 | 40-foot high | $150* |
| CSP (Trough) | 2,500 acre feet /yr | 5 | Up to 20-foot high | $140* |

*Data from unenergy.org. (Reliability – 10 being most reliable)

Specific technologies reviewed and studied for the Proposed Project are as follows:

#### Concentrated Photovoltaic

CPV technology uses layers of wafers to absorb different wavelengths of sunlight and provide more power conversion efficiency. This technology requires absolute alignment with the direct sunlight in order to be efficient. This critical alignment requirement places a big emphasis on dual tracking technology and is considered a risk due to the maintenance required to maintain that alignment. CPV technology also is designed to sit higher than traditional PV (as high as 40 feet above the surface). This additional height will present greater visual impacts than traditional PV. This technology is relatively new and there are risks for long-term performance reliability. Lastly, manufacturing capacity to supply large-scale utility projects is another risk that has not been proven to date.

### Concentrated Solar Thermal Power

Concentrated Solar Thermal Power (CSP) uses sunlight to convert water into steam and requires more water than traditional PV. As with CPV, CSP also has critical alignment needs due to the criticality of ensuring system mirrors constantly focus sunlight on the thermal collection media. This critical alignment feature creates the need for more substantial mechanical infrastructure than traditional PV and will require more maintenance.

## 2.4. Proposed Project Location and Setting

The Proposed Project would be located adjacent to I-15 within the Reservation in Clark County, Nevada approximately 30 miles north of Las Vegas. The ROW application covers approximately 10.5 acres of BLM land. It also covers approximately 105.5 acres of Reservation land, which is administered by BLM, all of which is in an existing utility corridor that contains existing electric transmission and gas pipeline infrastructure.

The Proposed Project is bounded by the Union Pacific Railroad on the east and a 4,000-foot wide utility corridor to the west, I-15 to the south and east, and a large ephemeral tributary of the California Wash to the north.

Proposed Project components would be constructed in the Dry Lake Valley. The legal description, township/range, and section for the Proposed Project are shown in Table 2-2 (also see Figure 2-1).

**Table 2-2.**
**Project Facilities by Legal Description**

| Facility | Township / Range | Section |
|---|---|---|
| Project footprint (area enclosed by perimeter fence) | T16S / R64E & T16S / R65E | 13,24, 25 & 17, 18, 19, 20, 30 |
| Existing project access road (Las Vegas Blvd., utility road) | T17S / R64E & T16S / R64E | 10, 15 & 33, 28,27, 22, 23, 14,13 |
| 500kV transmission line | T17S / R64E & T16S / R64E | 10 & 33, 28,27, 22, 23, 14,13 |
| Existing Crystal substation | T17S / R64E | 10 |
| 12kV transmission line to Travel Plaza | T16S / R64E | 13, 23,24,25,,36 |
| Facility substation | T16S / R64E | 13, 24 |

Table 2-2 Continued

| Facility | Township / Range | Section |
|---|---|---|
| O&M Area | T16S / R64E | 13 or 24 |
| Internal access: | | |
| Main solar field road | T16S / R64E | 13,24,25 |
| Maintenance road | T17S / R64E & T16S / R64E | 13,24,25 & 17,18,19,20,30 |
| Solar field (PV equipment, inverters, transformers) | T16S / R64E | 13,24,25 |
| Fire break | T17S / R64E & T16S / R64E | 13,24,25 & 17,18,19,20,30 |
| Additional project access road | T16S / R64E | 9,10,16,17,20 |

## 2.5. Proposed Project Components

Proposed Project components would be built in three phases (as described below), and would ultimately provide up to 350MW of electricity to the Crystal substation. Primary components would include the main access road, on-site substation, on-site operations and maintenance area, perimeter fence (potentially in phases), stormwater collection systems, evaporation pond, water pipeline, and electric transmission lines. Solar module arrays with all associated system components such as inverters, transformers, and distribution wiring would be added in multiple phases (as determined by the requirement of power off-takers). The 12kV transmission line that would link associated equipment adjacent to the Proposed Project substation to the Travel Plaza and the associated equipment to be added next to the Proposed Project substation would be constructed after Phase I is completed. All components, with the exception of the water pipeline, access road and power transmission lines, would be housed within the fenced 2,000 acre solar facility boundary.

The Proposed Project would include the following main elements (Figure 2-5):

- PV solar modules
- Single tracking systems mounted on embedded pier ballast or foundations
- Power inverters
- Three-phase pad mounted transformers that convert the output of each inverter to 34.5 kV
- An underground or overhead 34.5kV collection system to convey electricity from the solar field to the on-site substation
- On-site substation (approximately 15 acres)
- A 5.50-mile interconnection to the Crystal substation via an up to 500kV transmission line
- Modifications to the Crystal substation

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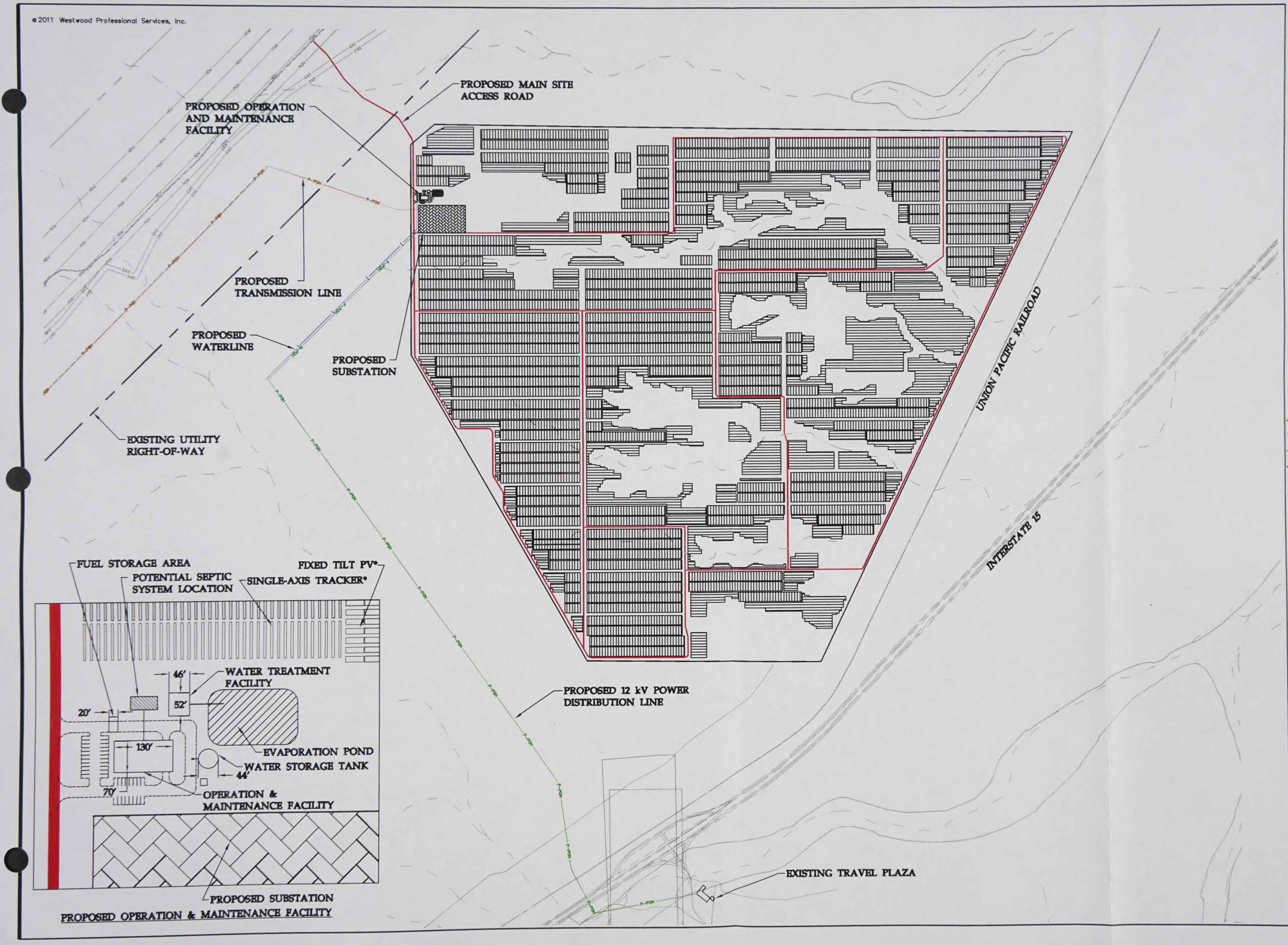
PROPOSED MAIN SITE ACCESS ROAD
PROPOSED OPERATION AND MAINTENANCE FACILITY
PROPOSED TRANSMISSION LINE
PROPOSED WATERLINE
PROPOSED SUBSTATION
EXISTING UTILITY RIGHT-OF-WAY
UNION PACIFIC RAILROAD
INTERSTATE 15
PROPOSED 12 kV POWER DISTRIBUTION LINE
EXISTING TRAVEL PLAZA
FUEL STORAGE AREA
POTENTIAL SEPTIC SYSTEM LOCATION
SINGLE-AXIS TRACKER*
FIXED TILT PV*
46'
52'
WATER TREATMENT FACILITY
20'
130'
EVAPORATION POND
WATER STORAGE TANK
44'
70'
OPERATION & MAINTENANCE FACILITY
PROPOSED SUBSTATION
PROPOSED OPERATION & MAINTENANCE FACILITY
P-POH

Westwood
Westwood Professional Services, Inc.
7699 Anagram Drive
Eden Prairie, MN 55344

PHONE 952-937-5150
FAX 952-937-5822
TOLL FREE 1-888-937-5150

www.westwoodps.com

*The selection of PV Tracker vs PV Fixed Tilt arrays installed on the site will vary in quantity based on market supply and capacity conditions at the time of construction.

Designed: MPG
Checked: ADC
Drawn: MPG
Record Drawing by/date:

Revisions:

| # | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Prepared for:

kRoad
295 Madison Avenue
New York, NY 10017

LEGEND

| | |
|---|---|
| —P-POH— | OVERHEAD POWER |
| —— | ACCESS ROAD |
| —P-POH— | PROPOSED 12 kV POWE DISTRIBUTION LINE |
| —I— | PROPOSED WATERLINE |
| ▥ | SINGLE-AXIS TRACKER PV ARRAY* |
| ▤ | FIXED-TILT PV ARRAY* |

N

0' 800' 1600' 2400'

# FIGURE 2-5
# Solar Facility Site Layout

Preliminary
Not For Construction

Date: 10/12/2011
Sheet: 1 OF 1

20111065SITE.dwg

- A 40-acre O&M area to accommodate the O&M building, parking area, temporary laydown area, evaporation/detention pond, and other construction associated facilities
- A 5.0-mile interior gravel/aggregate perimeter maintenance road
- An improved approximately 8-mile long service road along existing unimproved road within the BLM utility corridor
- Drainage controls to facilitate and/or slow drainage to existing ephemeral washes
- Stormwater controls within drainage features to slow flash flood flow to nearby railroad culverts
- Approximately 7.14 miles of perimeter fence.
- A 20-foot wide fire break around the perimeter of the solar facility.
- An approximately 3.0 mile12kV transmission line from the solar facility substation to the Travel Plaza.
- An approximate 1.0 mile water pipeline from the existing Reservation well to the solar facility O&M building.

Acreage and dimensions of specific Proposed Project components and additional details regarding these components are detailed in Table 2-3.

### Table 2-3.
### Proposed Project Proper Facilities, Acreage, and Dimensions

| Facility | Acreage | | Length | Width |
|---|---|---|---|---|
| **Facilities Within Perimeter Fence** | | | | |
| *Solar Facility* | *2,000* | | na | na |
| Solar Field (occupied by solar modules) | 1,800 | | | |
| Undeveloped Area | 200.00 | | | |
| 500kV Transmission Line | 5.0 | | 1,452' | 150' |
| 34.5kV Collection Lines (within solar field) | Unknown (approximated at 3.0) | | | |
| O&M Area – Total | 40 | | Variable | Variable |
| 12kV Transmission Line to Travel Plaza | 0.11 | | 200' | 25' |
| O&M Building | 0.21 | | 130' | 70' |
| O&M Parking Area | 0.10 | | 130' | 70' |
| O&M Laydown Area | 20.00 | | 925' | 925' |
| Facility Substation | 15.00 | | 800' | 800' |
| Internal Access Roads | | | | |
| Perimeter Road (west side) | 5.24 | | 2.16 miles | 20' |
| Solar Field Access Ways | 42.66 | | 22 miles | 16' |

**Table 2-3 Continued**

| Facility | Acreage | | Length | Width |
|---|---|---|---|---|
| Perimeter Fence | 2.60 | | 7.13 miles | 3' |
| **Subtotal** | | 2,000 | | |
| **Facilities Outside Perimeter Fence** | | | | |
| Firebreak | 17.28 | | 7.13 miles | 20' |
| Service Road (from county ROW) | 22.86 | | ~7.86 miles | 16'-24' |
| Up to 500kV Transmission Line | 100.00 | | 5.50 miles | 125' to 150' |
| Crystal substation Upgrades | 0.92 | | 200' | 200' |
| Water Line | 3.03 | | 1.0 mile | 25' |
| 12kV Transmission Line to Travel Plaza | 9.09 | | 3.0 miles | 25' |
| **Subtotal** | | | | |
| **Project Facilities Total Area** | | 2,153.18 | | |
| | | | | , |

Calculations: Acreage determined by (Length x Width) / 43,560 or determined by GIS software.

### 2.5.1. Substation, Transmission Line and Interconnections

The Proposed Project includes the construction of one (1) on-site substation (within the 2,000 acre solar facility) that would encompass approximately 15 acres in total area. The substation would include medium- and high-voltage switchgear and conductor structures, and (up to 3) 34.5 kV/230 kV or 500 kV transformers (each approximately 50-foot wide by 25-foot long by 20-foot high). Additionally, equipment will be added within the existing footprint for the connection to the Crystal substation, pursuant to an interconnection agreement, to connect power generated from the Proposed Project to the grid.

Each transformer would contain approximately 8,700 gallons of dielectric fluid (mineral oil) and would be located on a concrete pad approximately 75-foot long by 50-foot wide surrounded by a 6-inch high earthen or concrete containment berm or intergral secondary containment consistent with Resource Conservation and Recovery Act (RCRA) guidelines. The containment area would be lined with an impermeable membrane covered with gravel and would drain to an underground storage tank. Each transformer pad will be designed and constructed with perimeter secondary spill sumps that will be sized to capture and control the release of a full reservoir of dielectric fluid plus storm water flows resulting from a 100-year storm event. Contents of the secondary sumps will be periodically inspected in accordance with Best Management Practices (BMP's) for sheen or surface oil prior to disposal. If contaminants are present, the contents of the sump would be pumped by vacuum truck and disposed of at an approved site off the Reservation. If no sheen or other contaminants are detected, then the contents of the sump will be properly transferred to the on-site wastewater treatment system and discharged to the evaporation pond.

The up to 500kV transmission line interconnection lines would be single circuit and supported on color-treated steel poles/towers. Although final transmission line design has not been completed, an estimated 23 structures would likely be required for the construction of the up to 500kV line.

### Up to 500kV Transmission Line

The proposed transmission line will exit the proposed solar facility at the northwest corner and utilize the existing BLM 4,000-foot utility corridor running on the Reservation for 5.0 miles to the southern Reservation boundary and then for 0.5 miles on BLM land towards and into the Crystal substation. It will parallel the existing Kern River Gas Transmission pipeline. Specifically, the line will initiate at a substation at the northwest side of the proposed solar facility boundary and extend west to the utility corridor, then southwest within the utility corridor for approximately 2.7 miles. The line will then take a 45-degree turn at a corner structure and run south along the west side of the utility corridor to a structure location just north of the McCullough #3 structure approximately 300-feet south of where the McCullough 500 kV line exits the Crystal substation. From this point, the up to 500kV line crosses under the two existing 500kV lines and then turns 85 degrees to the north to proposed structure #2. The up to 500kV line then turns approximately 90 degrees extending west into an existing 500kV dead-end structure in the Crystal South 500 kV yard. This looping adjustment (a change from the Draft Environmental Impact Statement) to the Crystal substation connection is due to requirements for ground clearance of high voltage transmission wires both from the ground to wire and vertical distance between the proposed wire and existing wire; both a minimum of 25-feet. Figures throughout the Final EIS have been updated with the new route and the previous route depicted as "remnant" in the legends. There will be an approximate 0.5-mile section of the proposed transmission line that will leave the Reservation and cross into BLM land (Figure 2-6). The transmission line will be constructed so that the conductors and associated transmission line will not overhang into or across the Kern River gas pipeline ROW.

The Proposed transmission line within the BLM utility corridor will require a ROW grant from the BLM and an encroachment permit from Kern River Gas Transmission Company.

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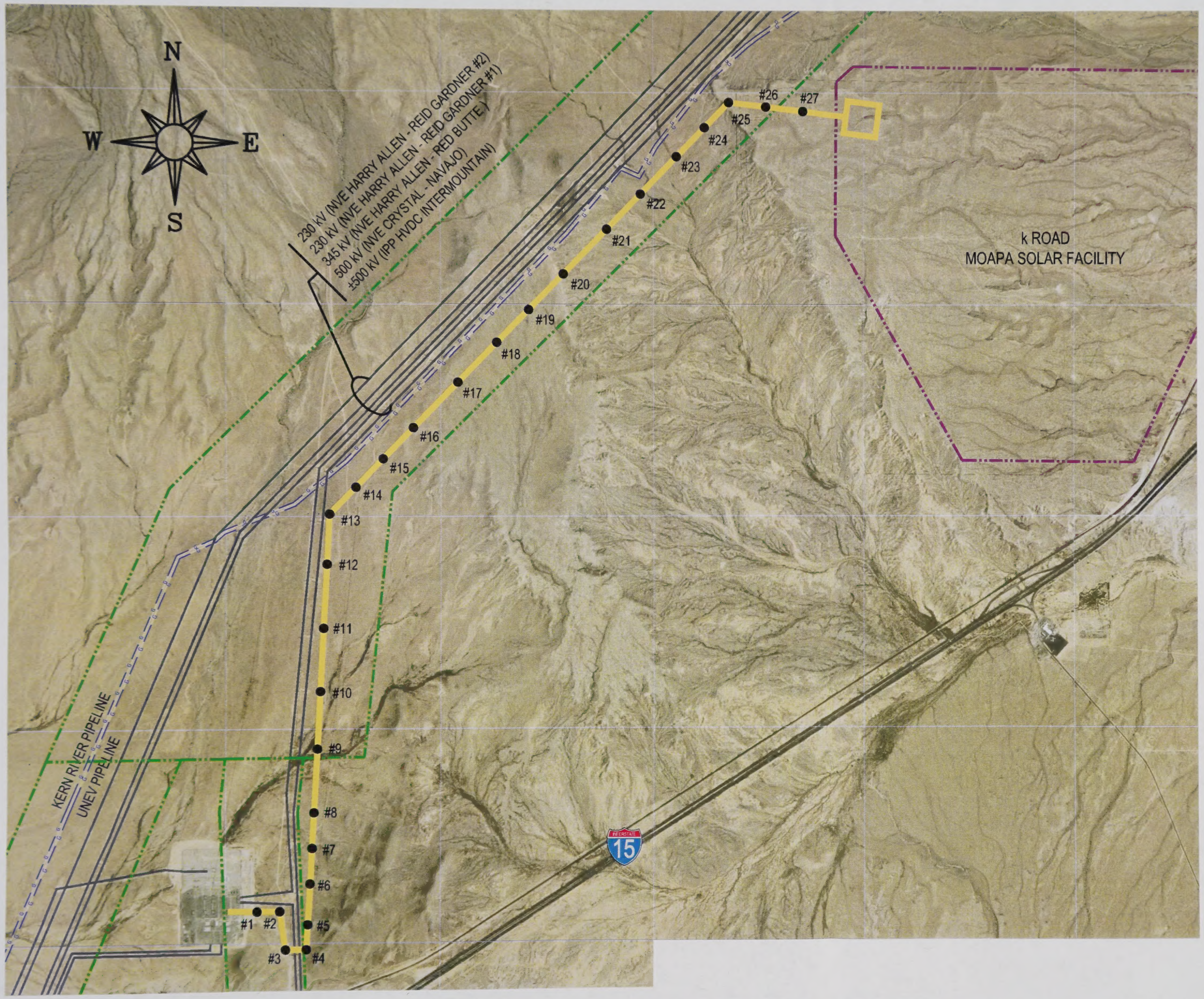
N
W
E
S
230 kV (NVE HARRY ALLEN - REID GARDNER #2)
230 kV (NVE HARRY ALLEN - REID GARDNER #1)
345 kV (NVE HARRY ALLEN - RED BUTTE)
500 kV (NVE CRYSTAL - NAVAJO)
±500 kV (IPP HVDC INTERMOUNTAIN)
k ROAD
MOAPA SOLAR FACILITY
KERN RIVER PIPELINE
UNEV PIPELINE
INTERSTATE 15
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
#15
#16
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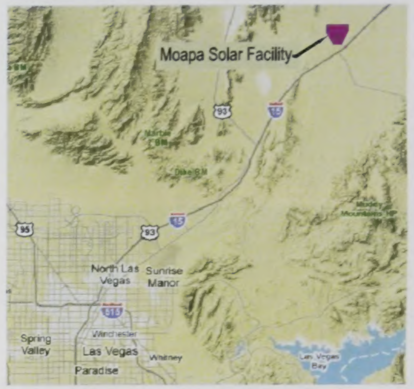
## PROJECT VICINITY MAP


Moapa Solar Facility
93
15
95
North Las Vegas
Sunrise Manor
Spring Valley
Las Vegas
Paradise
Whitney
Winchester
215

## LEGEND:

- TRANSMISSION LINE ROUTE
- EXISTING TRANSMISSION LINES
- EXISTING GAS PIPELINE
- MOAPA SOLAR FACILITY
- UTILITY CORRIDOR

## NOTE:

PIPELINE LOCATION DATA IS OBTAINED FROM GIS DATABASE AND SHOWS GENERAL CORRIDOR LOCATION (NOT SURVEY ACCURATE).

September 2011

FIGURE 2-6

FILE LOCATION: L:\KROAD\KRS-002 MOAPA SOLAR\11 DRAWINGS\05-ROUTE MAP\CONCEPTUAL DESIGN MAP\KRS-05-001.DWG LAST SAVED BY: asereda 2/2/2012 5:24 PM PLOTTED BY: Todd Smith 2/3/2012 5:25 PM Tab:Model

"Engineering with Distinction"
ECI ELECTRICAL CONSULTANTS, INC.
SALT LAKE CITY, UTAH

| NO | REVISION | DATE | BY | APR |
|---|---|---|---|---|
| A | PRELIMINARY CONCEPTUAL DESIGN | 09/13/11 | AVS | ECI |

k Road Power

| ENGINEERING RECORD | | DATE |
|---|---|---|
| DRAWN | AVS | 05/04/11 |
| DESIGNED | LWE | 05/04/11 |
| CHECKED | | 05/05/11 |
| APPROVED | | |
| DWG SCALE: | PLT SCALE: | |

MOAPA SOLAR PROJECT
ROUTE MAP DRAWING
DWG. NAME: KRS-05-001
REVISION NO : A

### 12kV Transmission Line

A Proposed 12kV transmission line is planned to deliver energy to the existing Moapa Travel Plaza located at exit 75 off I-15, south and west of the 2,000-acre site. The 12kV transmission line will originate at the on-site substation and travel southwest until it reaches the existing water line ROW (Figure 2-5). The 12kV transmission line will then parallel this existing waterline pipeline to its endpoint at the Travel Plaza. The 12kV pole structures will be approximately 20 to 40-feet in height and made of wood with 6 to 8-inch diameter. The poles will have a single cross-arm and look similar to the existing transmission line structures that parallel the Union Pacific Railroad levee. Plans for crossing over or under the railroad and I-15 have not been developed to date. The Proposed 12kV transmission line is approximately 3 miles in length and will meet the current energy needs of the Travel Plaza. (Note: The project owner will not be responsible for providing power directly to the Moapa Tribe.) The 12 kV line will be connected to equipment adjacent to one of the facility's 34.5/500 kV transformers and the power will be supplied by the utility entity of that system. Permits and rights of way to cross the railroad/I-15 easement will be obtained by the Tribe per the lease agreement. Connection of the 12kV line to the Travel Plaza substation will also be the responsibility of the Tribe. The 12kV line is not expected to be engineered or constructed until after Phase I of the solar facility is complete. The 12kV line will be wholly owned by the Tribe.

### Collection Lines

Project design will entail installing PV modules in array blocks of up to 2 MW per block. Each 2 MW block will transfer power to a designated inverter pad where DC power will be converted to AC power. All power from these inverter pads will be transferred to the on-site sub-station at 34.5 kV with a network of underground and/or on the ground wiring (not to exceed height of solar panels).

### Interim Electric for Construction

There will not be any utility-provided power at the project site during the initial phases of construction. Up to three portable generators will be used by the Engineering, Procurement and Construction (EPC) contractor for any temporary power needs. An estimated total of 750-1000 hp of generator power will be used during the initial construction phase of the project. As utility-quality power is generated on site and delivered to Crystal, an independent power supply will be provided to the site through the newly created transmission system for future construction and ancillary power support for during normal operations.

## 2.5.2. Water Pipeline

The proposed 6-inch diameter water pipeline will link the existing Reservation well (TH-1) to the proposed O&M building. The construction ROW is proposed at 25-feet wide. Herbaceous vegetation will be allowed to revegetate over the ROW once construction is complete. The pipeline will be constructed of ductile iron or Polyvinyl chloride (PVC). This will be the main source of water for all operations and maintenance for the solar facility. The water pipeline will provide potable water to the O&M building for personnel use, water to the fire protection system via the above ground water storage tank and provide water for construction dust control as well as solar panel washing during operations.

### 2.5.3. Electrical Components

#### Electrical System for Plant Auxiliaries

Plant auxiliaries are secondary electrical components that would ensure the uninterrupted operation of the solar facility during non-daylight hours. These auxiliary needs may include nighttime lighting of the facility, electricity to keep the transformers charged, power to the O&M building, and power for rotating the tracker units to the eastern start position for electricity generation the next day.

Power for plant auxiliaries as well as power to the Travel Plaza would be supplied by back feed from the electrical grid. Power from the distribution service would be stepped down (lowered) to an approximate voltage to support the solar plant auxiliaries and the Travel Plaza.

#### Solar Meteorological Stations

There is currently one (1) meteorological station installed on-site collecting insolation data as well as various standard weather data. The purpose of this system is to provide ground monitoring data that accurately depicts the real-time insolation potential of the site that will be used to substantiate annual power quantities generated by the facility. An independent contractor has been retained to provide periodic operations and maintenance services as well as collect and generate monthly reports of all data generated. Additional stations may be required depending on the requirements outlined in one or more PPAs and/or financial entity securing equity to fund the project.

### 2.5.4. Access Roads

#### State/County Road

Primary access to the site will be via exit 64 off Interstate 15, west bound on Hwy 93, and an immediate turn on Las Vegas Blvd, a state-maintained frontage road. Las Vegas Boulevard is well paved for approximately 5.80 miles from the I-15 exit to the end of NDOT maintenance and jurisdiction. From there an unmaintained paved road continues towards the Crystal substation to a left-hand or northerly turn at approximately 1.96 miles. Once leaving the paved portion, the access road becomes an improved dirt utility road within the 4,000-foot wide utility corridor. The access road would be improved to a design consistent with Clark County Department of Transportation guidelines and would terminate at the northwest corner of the Proposed Project boundary. The improved access road is approximately 5.50 miles in length from the Crystal substation location to the project site boundary access point where an improved 0.5-mile entrance onto the mesa would need to be constructed (Figure 2-7).

### Main Internal Facility Road

A new gravel/aggregate main facility road network will be constructed approximately 5-6 miles long and 20-foot wide. This road will be constructed just inside the perimeter fence and traverse the site to provide access to various critical locations. The road will also be the main access between the north entrance/exit and the temporary laydown area, substation, and O&M building.

### Solar Field Access Ways

Within the solar facility and perpendicular to the main facility road, new access ways will be graded and compacted to allow for two-wheel drive access to the solar equipment during operations and maintenance. These access ways will be approximately 13 to 16-foot wide and would be spaced in a grid format, evenly distributed within each solar array block.

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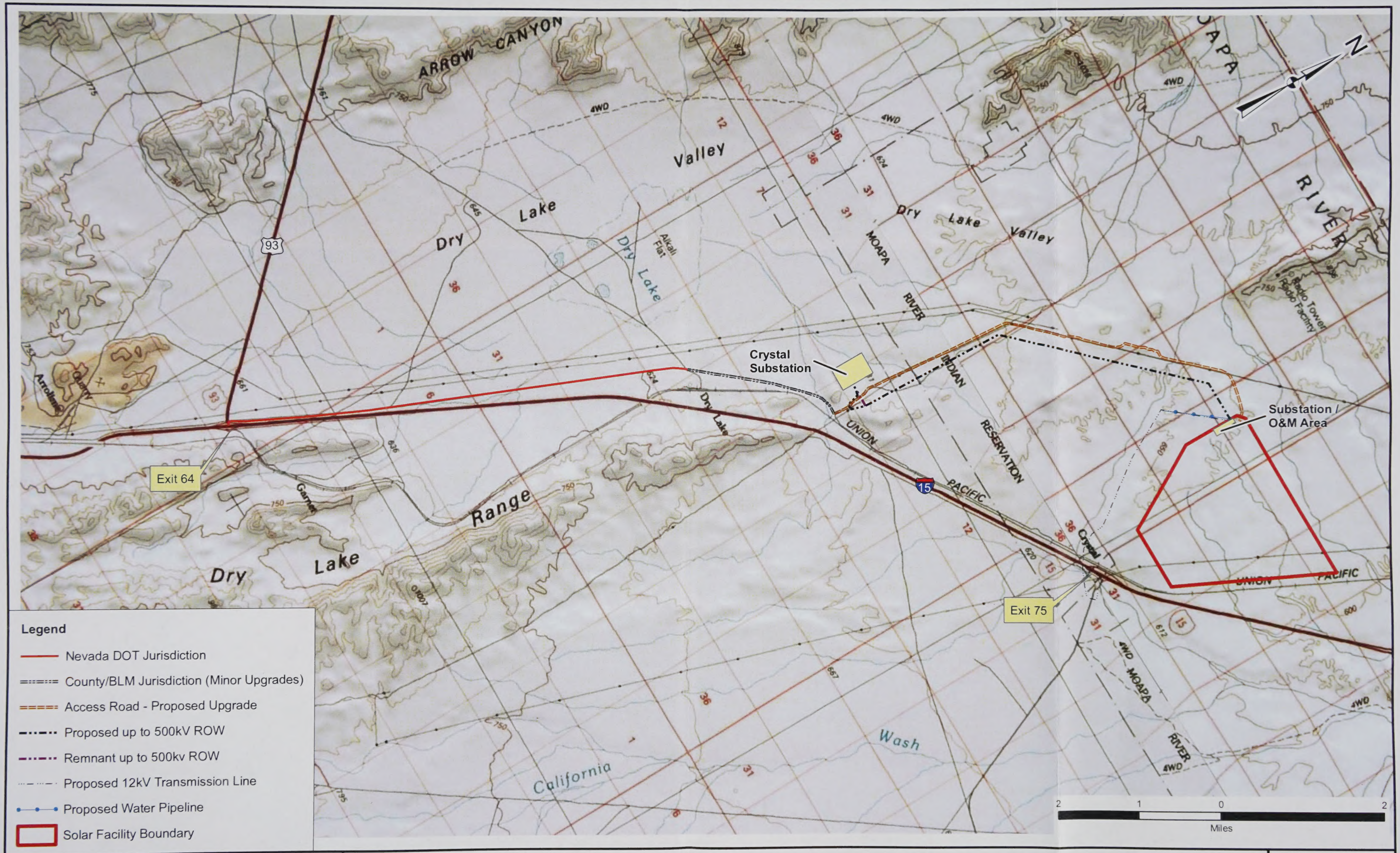

ARROW CANYON
Dry Lake Valley
Dry Lake
Alkali Flat
Dry Lake Valley
MOAPA RIVER INDIAN RESERVATION
MOAPA RIVER
Crystal Substation
Substation / O&M Area
Radio Tower
Radio Facility
Exit 64
Exit 75
UNION PACIFIC
Dry Lake Range
Garnet
Arrolime
Quarry
Crystal
California Wash
4WD
93
15
N
Legend
Nevada DOT Jurisdiction
County/BLM Jurisdiction (Minor Upgrades)
Access Road - Proposed Upgrade
Proposed up to 500kV ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Proposed Water Pipeline
Solar Facility Boundary
2 1 0 2
Miles

[redacted]

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Access Roads to the
Proposed Project

MALCOLM PIRNIE, INC.

February 2012

FIGURE 2-7

### 2.5.5. Fencing

The Proposed Project would include an 8-foot high chain link perimeter fence with three strands of barbed-wire at the top. To discourage burrowing by desert tortoise, the perimeter fencing would include 1-inch by 2-inch mesh welded wire buried a minimum of 12 inches below ground with 22 to 24 inches above ground. The perimeter fence is approximately 7.13 miles in length. Gates would be used at access areas with cattle guard crossings to deter movement of desert tortoise entering the solar facility. Earthen ramps to the exterior of the facility would be built within and under the cattle guards to facilitate escape should desert tortoises fall within. The desert tortoise/cattle guards have also been used by the Federal Highway Administration (FHWA) for road projects with success.

### 2.5.6. Exterior Fire Break

A 20-foot wide, 7.13-mile long fire break would be constructed and maintained around the solar facility perimeter fence to prevent wildfire from entering or exiting the site.

### 2.5.7. Operations and Maintenance Area

The Proposed Project O&M area would contain an O&M building 130 feet by 70 feet with a height of approximately 15 feet. The O&M building would house administrative staff, maintenance facilities, and ancillary support systems such as water treatment and component storage. The main Control Room housing the main supervisory control and data acquisition (SCADA) system will be housed within the O&M building. A gravel parking lot would be constructed adjacent to the building, capable of holding up to 50 vehicles.

### 2.5.8. Fire Protection System

The Proposed Project's fire protection system would include one above-ground storage tank with a 150,000-gallon capacity located adjacent to the O&M building and filled from the existing well located on the Reservation. The system would have a minimum of 2 hours of full-flow runtime (rated using a 250 gpm pump). One primary electric and one back-up diesel fueled firewater pump would deliver water to the fire protection water piping network. Smaller, motor driven electric pumps would also assist in maintaining pressure throughout the piping network.

### 2.5.9. Security

Security at the solar facility would include fencing, lighting, and security patrols. The solar facility would be staffed 24 hours per day, seven days per week. The staff would include full-time security personnel who would conduct routine security patrols of the site.

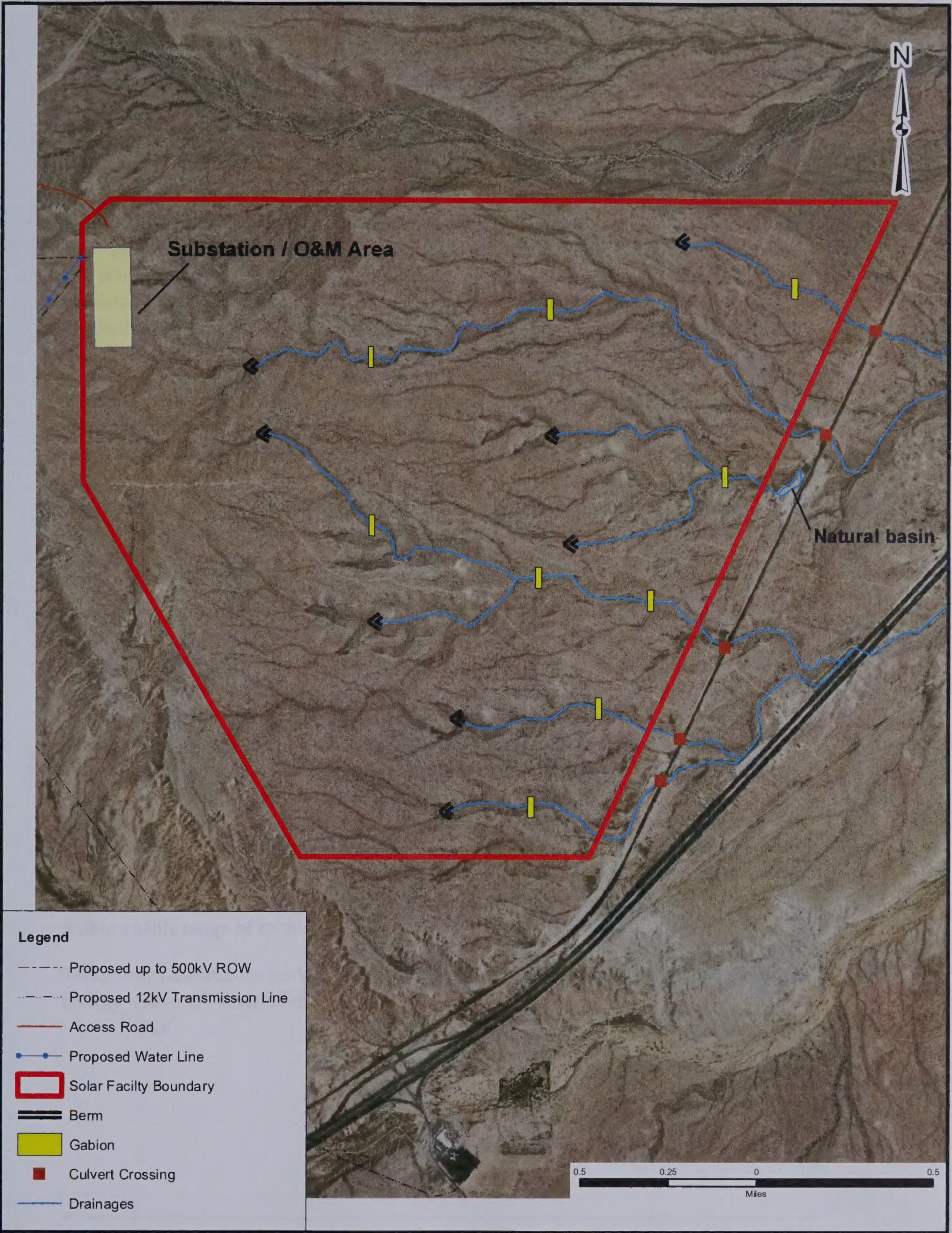
### 2.5.10. Lighting

Permanent lighting would be installed along the permanent solar facility road and within the substation and O&M area. Outside lighting would be installed on poles within the

O&M area. Lighting would be designed to provide minimum illumination needed to achieve objectives and not emit excessive light to the night sky by focusing desired light in a downward direction. Lighting will not be erected within the solar field; however, truck-mounted lights may be used at night for maintenance or to provide security measures when needed.

### 2.5.11. Erosion Control and Stormwater Drainage

The majority of the site would drain naturally as sheet flow to the existing large, ephemeral drainage features found on site. The drainage plan would use berm-like structures to slow excessive runoff on the eastern side of the site where elevations decrease and flatten prior to discharge under multiple culverts placed within the existing railroad levee. Given the caliche soil and rock cliffs prevalent throughout most major drainage areas, rock weir structures or gabions may be used to slow flash flood flow prior to discharge under the existing railroad culverts (Figure 2-8) to ensure no structural damage. No offsite drainage enters the mesa or the solar facility; therefore, only surface sheet flow from the improved areas will need to be accounted for to ensure safe and natural discharge of stormwater.


N
Substation / O&M Area
Natural basin
Legend
Proposed up to 500kV ROW
Proposed 12kV Transmission Line
Access Road
Proposed Water Line
Solar Facilty Boundary
Berm
Gabion
Culvert Crossing
Drainages
0.5
0.25
0
0.5
Miles

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

## Erosion Control and Stormwater Drainage Plan (Preliminary)

MALCOLM PIRNIE, INC.

September 2011

FIGURE 2-8

Map Document:Austin/6923001/GIS/MXD/EIS/Figure 2-8

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## 2.6. Proposed Project Construction

### 2.6.1. Project Phasing

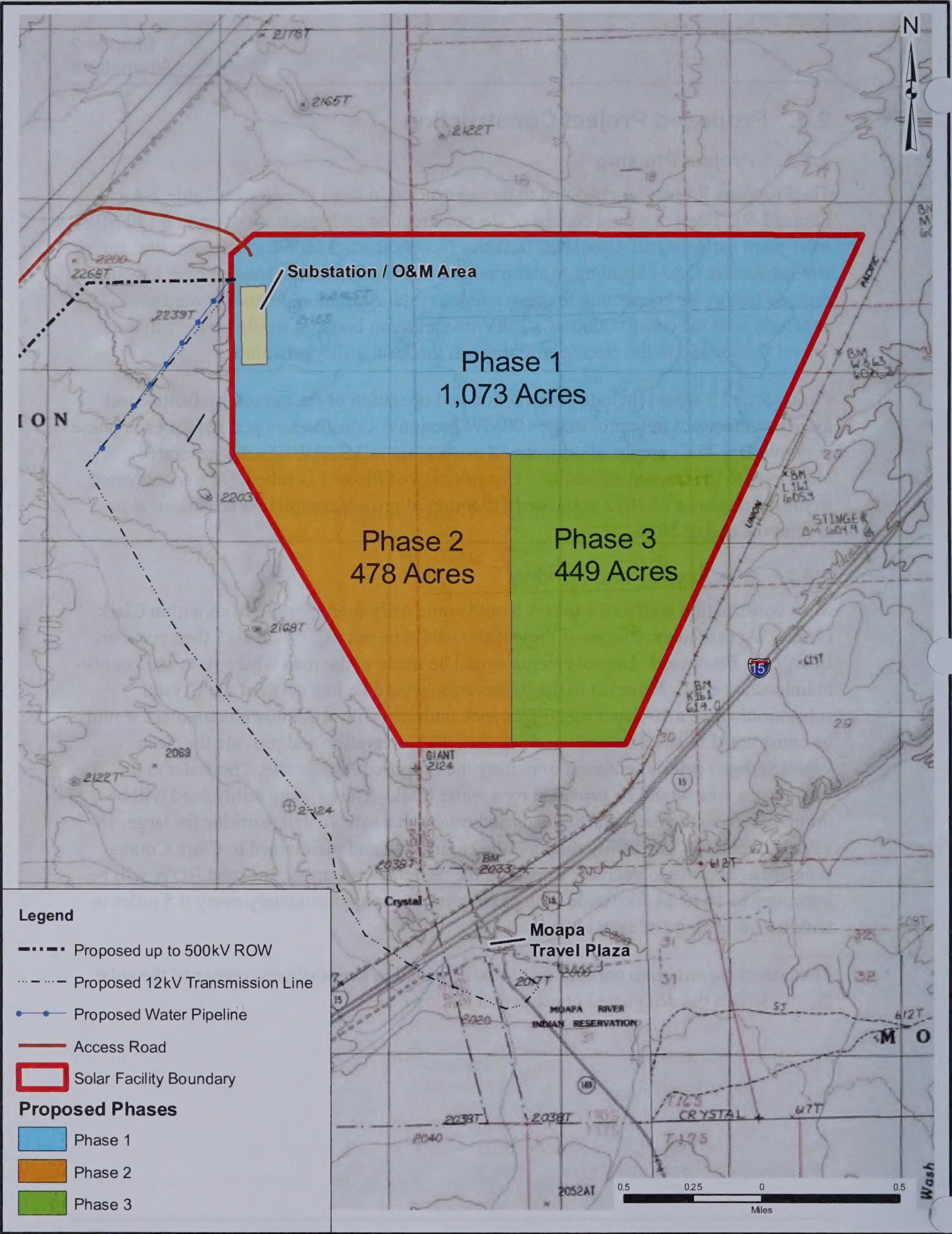
The Proposed Project is scheduled to be constructed in three phases (see Table 2-4 and Figure 2-9). Phase 1 would consist of the construction and operation of up to a 150 MW solar plant including all associated facilities (access road, 500kV transmission line, on-site substation, O&M building, water pipeline, and facility access road). Phase 1 would provide energy by connecting to the existing Crystal substation. Phase 1 would also conclude with the construction of a 12kV transmission line that would connect to the Travel Center and to the electric grid through the local utility provider.

Phases 2 and 3 would include construction and operation of the remaining facility and associated features in approximate 100MW sections. Construction periods for each phase may overlap. The completed project will provide up to 350MW of solar generated electricity to the Crystal substation. Construction of Phase 1 is scheduled to commence in the third quarter of 2012 at the earliest and final project completion scheduled at or around the end of 2016.

### 2.6.2. Site Access and Parking

Most construction staff and workers would come daily to the jobsite from within Clark County. Access to the Proposed Project site would be via exit 64 off I-15 then north on Las Vegas Boulevard. Improvements would be made to the road where state and county maintenance ends. Entrance to the Reservation would be just north of the Crystal substation where a 100-foot by 20-foot rock entrance with wash down equipment would be constructed to stabilize entrance/exit into the Reservation and provide for clean vehicle wheels prior to entering or exiting the Proposed Project site. The water at the wash down area would be provided by a water truck. The existing utility road will be improved to handle daily traffic loads and establish a safe vehicle corridor for large, 18-wheeled vehicles. The utility road will be engineered and maintained to Clark County standards. In order to decrease impact to the desert environment, the road ROW will be improved to 16 to 24-foot wide with passing turn-outs approximately every 0.5 miles or within visible range of each other.

Temporary construction parking would be provided in the northwest corner of the solar facility within the designated construction laydown area.


N
Substation / O&M Area
Phase 1
1,073 Acres
Phase 2
478 Acres
Phase 3
449 Acres
Moapa
Travel Plaza
Crystal
MOAPA RIVER
INDIAN RESERVATION
GIANT
2124
15
Legend
Proposed up to 500kV ROW
Proposed 12kV Transmission Line
Proposed Water Pipeline
Access Road
Solar Facility Boundary
Proposed Phases
Phase 1
Phase 2
Phase 3
0.5
0.25
0
0.5
Miles

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Proposed Project
Construction Phases (1-3)

MALCOLM PIRNIE, INC.

September 2011

FIGURE 2-9

Map Document: Austin/6923001/GIS/MXD/EIS/Figure 2-9

## Table 2-4.
## Project Construction Schedule Estimate (by Phase)

| Task | Description | 4Q 10 | 1Q 11 | 2Q 11 | 3Q 11 | 4Q 11 | 1Q 12 | 2Q 12 | 3Q 12 | 4Q 12 | 1Q 13 | 2Q 13 | 3Q 13 | 4Q 13 | 1Q 14 | 2Q 14 | 3Q 14 | 4Q 14 | 1Q 15 | 2Q 15 | 3Q 15 | 4Q 15 | 1Q 16 | 2Q 16 | 3Q 16 | 4Q 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Environmental Clearance | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Site Access / Perimeter Fencing | | | | | | 1 | 1 | 1 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Site Preparation / Internal Access Roads | | | | | | | | 1 | 1 | 1 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 3 | 3 | | | | | | |
| 4 | O&M Area – Building Construction | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Drainage Controls | | | | | | | | 1 | 1 | 1 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 3 | | | | | | |
| 6 | Substation / Switchyard | | | | | | | | 1 | 1 | 1 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | 3 | 3 | | | | |
| 7 | Overhead Pole / Line Construction | | | | | | | | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | PV Equipment Installation /Commissioning | | | | | | | | | 1 | 1 | 1 | 1 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 2 | 2 | 2 | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | 3 | 3 | 3 | | | |
| 9 | Commercial Operation | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 2 | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | 3 | | |

### 2.6.3. Construction Workforce

The on-site construction workforce would consist of scientists, laborers, craftsmen, supervisory personnel, and construction management personnel. In total there will be approximately 250-300 workers onsite, on average. There could be as many as 400 workers on-site during the peak of construction activities.

Construction will occur six days a week for an estimated 10-12 hours per day. Additional hours may be necessary to make up for schedule and weather delays. Due to extreme heat during summer months, cement crews (for example), may need to work during night-time hours to avoid extreme heat that would complicate curing and drying of cement.

#### Temporary Structures

Temporary structures such as pre-fabricated buildings or tents would be erected to provide a covered work area for storage and assembly of materials. The structures would also be used to provide cover from direct sunlight, allow for crew meetings, and provide emergency relief during extreme weather. All temporary structures will be removed from the proposed laydown / O&M area after construction is complete.

### 2.6.4. Truck Trips and Deliveries

During peak construction, an average of 47 truck trips per day would be required to supply concrete, construction materials, Proposed Project components, and equipment to the site (Table 2-5). An additional estimated 300 passenger vehicles would also make a round trip to the site. The use of bus pooling will be investigated to reduce daily round trips of construction worker vehicles. Concrete for PV module foundations, if required, would be procured using an on-site ready-mix operation depending on the amount of concrete needed for the project, otherwise concrete will be provided by an off-site ready mix plant. Several such plants exist within a 15-mile radius of the Proposed Project. Construction materials such a pipe, PV modules, solar module assemblies, wire and cable, fuels, reinforcing steel, transformers and inverters, and small tools and consumables would also be delivered to the site by truck.

## Table 2-5.
## Truck Trips, Deliveries, and Mileage

| Description | Activity | Make / Model | Fuel | Maximum Quantity per day | Frequency | Horse-power | Vehicle Weight (tons) | Max Daily Offsite Round-trip Distance per Vehicle within general area (mile/day) | Offsite Travel to and from |
|---|---|---|---|---|---|---|---|---|---|
| Concrete Delivery Truck for General Construction | | | Diesel | 2 | Daily | 250 | 20 | 80 | North Las Vegas |
| Dump Truck | | | Diesel | 1 | Daily | 250 | 20 | 0 | on-site only |
| Flatbed Truck | | | Diesel | 5 | Daily | 250 | 10 | 0 | on-site only |
| Staff & Security Truck | Site Inspections & Security | Toyota Highlander or similar | Gasoline - Hybrid | 4 | Daily | 187 | 2.25 | 0 | on-site only |
| Pickup Truck | | | Gasoline | 10 | Daily | 175 | 4 | 0 | on-site only |
| Road Preparation Materials Truck | | | Diesel | 10 | Daily | 250 | 20 | 15 | on-site only |
| General Materials Delivery Truck for General Construction | General Construction Materials and fuel | Transport truck | Diesel | 1 | Daily | 250 | 20 | 100 | Las Vegas |
| PV Module, Tracker, & Electrical component Delivery | PV Panels Delivery Truck | Transport truck | Diesel | 5 | Daily | 250 | 10 | 100 | Las Vegas |
| | Steel Delivery Truck | Transport truck | Diesel | 6 | Daily | 250 | 10 | 100 | Las Vegas |
| | Electrical and Control Systems Delivery Truck | Transport truck | Diesel | 1 | Daily | 250 | 10 | 100 | Las Vegas |
| Water Delivery Trucks | water will be provided by on-site ground water well | 3700 gal truck | Diesel | 2 | Daily | 300 | 30 | 0 | on-site only |
| Total | | | | 47 | | | | | |
| Worker Passenger Vehicles | Community to Work | Passenger vehicles | Gasoline & diesel | 300 | Daily | 100 | .5 to 2 | 100 | Las Vegas |

### 2.6.5. Construction Materials and Equipment

A small amount of concrete would be poured in place for equipment and building foundations, fence footings, and miscellaneous small pads. Aggregate or caliche base material would be used for the parking lot, substation and main facility road. An estimated 50,000 tons of road base and aggregate material would be required for the construction of the main facility road and surfacing of the substation and O&M parking area. Although as much on-site fill material will be used as practical, most of the aggregate would be procured from an off-site location and trucked to the site.

Initial grading work would be completed by rubber-wheeled or track-driven machinery such as tractors, dozers, tillers, rollers, and limited use made of excavators, graders, dump trucks, and end loaders, in addition to pickup trucks, water trucks, and cranes. The large equipment would be on-site during the preliminary phases of earthwork, access road improvement, and new road construction. Fuel storage for this equipment will be kept on-site and in an approved area with proper containment. Once completed, civil work would continue with the use of concrete trucks, trenchers, drill rigs, and additional support vehicles.

### 2.6.6. Construction Sequencing

#### Environmental Clearance

Environmental clearance activities would be performed primarily before the onset of Phase I construction; however, environmental monitors would be in place during the entire construction period to minimize impacts to natural resources, focusing on access roads after the solar facility is completely fenced. During the environmental clearance stage, trained biologists would relocate desert tortoises and perform any sensitive species mitigation. Activities associated with relocation and translocation of desert tortoises would follow guidelines outlined in the desert tortoise Translocation Plan (Appendix B) and regulated under the Biological Opinion completed by the U.S. Fish &Wildlife Service. Desert tortoise fencing would be installed around the entire solar facility boundary prior to translocation to ensure no influx of desert tortoises into the site after the start of construction.

#### Temporary Access Road Construction Fencing

Temporary construction fencing may be used to protect or deter desert tortoise movement in high traffic areas along access roads if any are determined during the preliminary construction period by authorized biologists (e.g. along sections of roadway where desert tortoise crossings are common). Temporary fencing would be of wire cloth or similar to silt fencing and would be buried into the ground to deter burrowing tortoises from crossing the access road.

### Site Access and Laydown Area

Following the environmental clearance for the access road and completion of desert tortoise fencing of the Proposed Project, the activities to upgrade the road and prepare the laydown area (parking, O&M area, substation) would begin. These activities described below would only occur during Phase I of the construction process and would not be repeated for Phase II and III.

- The parking, O&M area, and substation would be cleared and grubbed of vegetation. Organic matter would be mulched on-site or hauled to the Moapa compost facility located nearby.
- The access road would be widened and improved according to the Plan of Development (POD) approved by the BLM.
- Construction entrance and exit gates would be established.
- A tire wash area would be established near the Crystal substation prior to entering the Reservation to prevent soil and material from entering/leaving the Proposed Project site and to maintain clean access along Las Vegas Boulevard as well as limit the introduction of weeds and invasive species onto the Reservation. Water would be provided via a water truck.
- Equipment storage and laydown areas would be compacted to aid in dust suppression and the perimeter would be staked and marked with signs.
- The main facility road would be prepared with aggregate or similar road base material.
- The access road along Las Vegas Boulevard where state maintenance ends will be upgraded or improved in accordance to Clark County guidelines to allow safe travel of large vehicles as well as to support daily traffic loads and weight.

### Proposed Project Water Supply

The Proposed Project would require approximately 380 acre feet (acft) of water during the construction phase (72 acft/year for five years) and no more than 20 to 40 acre feet per year (AFY) for operations and maintenance. During the construction period, approximately 95 percent of the water use will be attributed to dust control measures along the access road and within the active construction site. A small percentage of water may be used for personnel needs and cleaning modules soiled during construction.

Water for the Proposed Project has been allocated by the Tribe from the existing well located one mile southwest of the solar facility. The lease agreement allots a maximum of 50 AFY for the Proposed Project. Additional water may be purchased from the Tribe during the construction period to meet the estimated 72 AFY demands. The Tribe's permitted groundwater usage for the Reservation, set by the state engineer, is 2,500 AFY.

A direct pipeline will be constructed from the proposed O&M area to the existing water pipeline that supplies water to the Travel Plaza. This pipeline will be approximately 1-mile in length and be used to fill an on-site, 150,000-gallon, above-ground water storage tank. Water from this tank will be used for domestic water use, fire prevention, and to clean PV modules up to four times per year. The water will serve as a temporary water source for dust suppression during the construction period.

A secondary water source located approximately 1-mile north of the Proposed Project may also be used for construction purposes. If this water well is used as a public water system then it would meet all drinking water standards as regulated by the EPA. The test wells have adequate unimproved road access and the ability to fill water trucks at the wellhead. The wells are estimated to have the ability to deliver water at 1,000 to 1,500 gallons per minute (Figure 2-10), a capacity greater than the existing proposed use well.

### Site Preparation

Vegetation Clearing and Grading

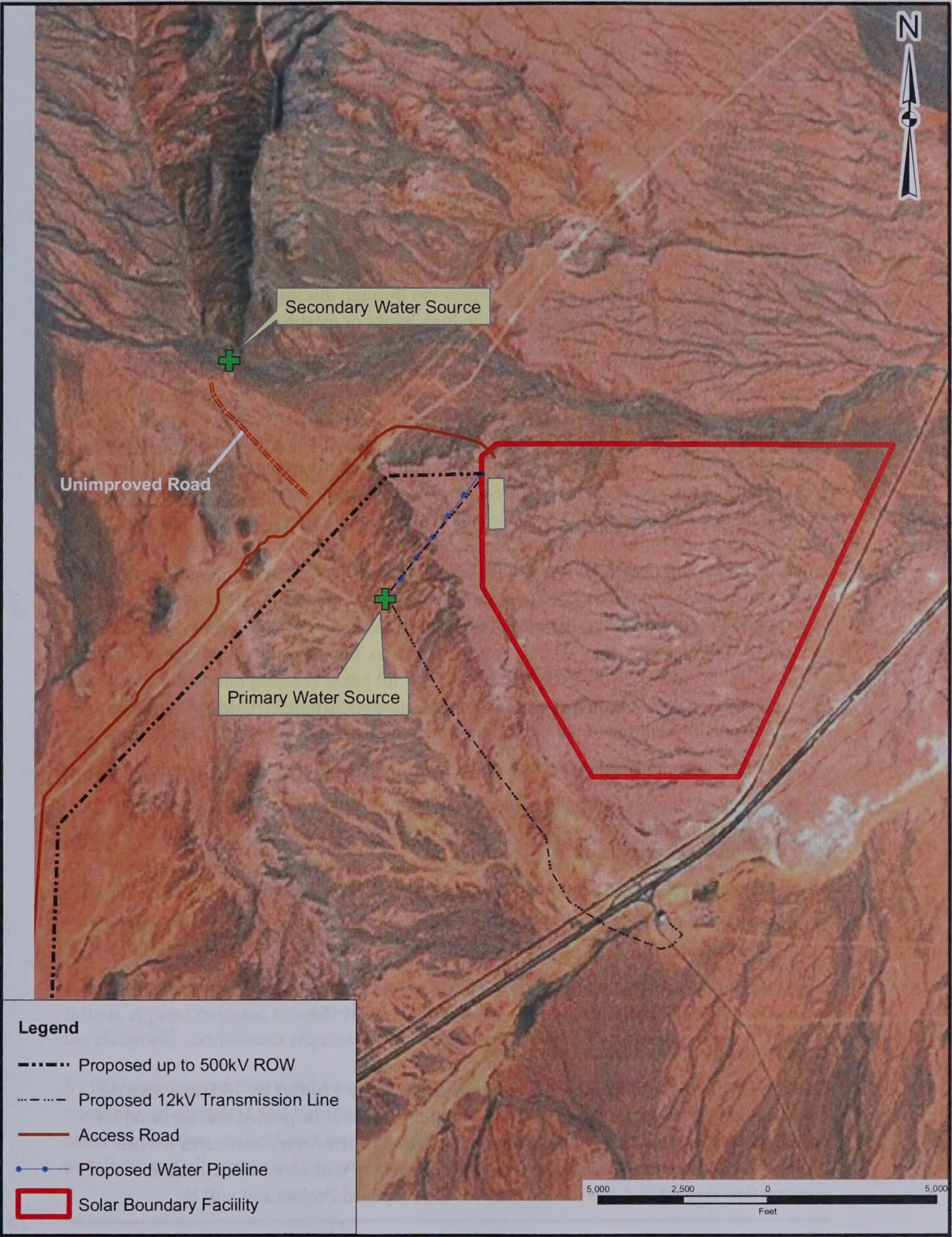
Vegetation would not be removed from the solar facility area unless it is located along planned access or maintenance roads or the area requires grading to ensure stable or level area for PV module construction. All vegetation cleared from the site will be hauled to the nearby Moapa compost facility located north and west of the Proposed Project near the Travel Plaza. Vegetation that interferes with PV modules will be trimmed or mowed to 12 inches. Cacti and yucca will be relocated from impacted areas prior to construction in accordance with the Biological Opinion.

Noxious Weed Control

A Weed Management Plan (Appendix C) would be prepared and submitted to the BIA, BLM and the Tribe for review and approval before construction begins. A Weed Management Plan is a planning document that acknowledges and assesses the realities of weed risk and treatment obstacles. The Plan will recognize the Proposed Project's impact on vegetation and define the expected treatments and activities necessary to both maintain the determined desired conditions for the vegetation community within the Reservation, and control the weeds that may arise within the Proposed Project's 2,000-acre solar facility footprint. In lieu of a completed weed plan at this date, the weed control expectations and requirements are summarized as follows:

- Weed seed production and/or plant growth will be controlled or eradicated in a manner established by the Tribe and to the extent or degree as determined by the BLM on the BLM ROW.

- Established noxious weeds and invasive species within the Proposed Project's pre-existing footprint will be controlled to a level equal to or below that of the original site or adjacent lands.


N
Secondary Water Source
Unimproved Road
Primary Water Source
Legend
Proposed up to 500kV ROW
Proposed 12kV Transmission Line
Access Road
Proposed Water Pipeline
Solar Boundary Faciility
5,000
2,500
0
5,000
Feet

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Water Source Locations

MALCOLM PIRNIE, INC.

September 2011

FIGURE 2-10

Map Document:Austin/6923001/GIS/MXD/EIS/Figure 2-6

- Herbicide use for noxious weeds and invasive species will be restricted to areas within the fenced solar facility.

Firebreak

A 20-foot wide firebreak will be constructed around the perimeter of the solar facility boundary to prevent wildfire from entering or exiting the site. Construction of the firebreak would require removal of all vegetation through discing or use of a grader. The firebreak will not be constructed within the high banks or established channels of ephemeral washes.

Dust Control

The construction phase of the Proposed Project would temporarily cause fugitive dust related to grading, vehicle traffic, drilling bore holes, and other construction activities. Dust control measures, outlined in the Storm Water Pollution Prevention Plan (Appendix D), will be in compliance with Clark County requirements and will only incorporate water controls due to the presence of threatened species within the Proposed Project. Binding agents and chemicals are not allowed for use under USFWS protocol near known threatened and endangered species locations. The following BMPs would be incorporated to minimize fugitive dust and wind erosion:

- Minimize grading and vegetation removal.
- In areas where vegetation removal and/or grading is required, delay the process of vegetation remove to the maximum time required prior to module installation.
- Limit vehicle speed on access road and on solar facility roads to 15 mph.
- Apply water to disturbed soil areas using water trucks to control dust and maintain proper moisture levels for soil compaction. Minimize over application of water to prevent runoff and ponding.
- Suspend excavation and grading during periods of high wind.
- Cover all trucks hauling soil or other loose material in and out of the Proposed Project site.
- Gravel or aggregate should be used where access roads meet paved roads to limit offsite disturbance and prevent mud and dirt track-out.

### Operations and Maintenance Building

O&M area grading will include an area of approximately 130 feet by 70 feet where the O&M building will be constructed. The remaining area will be graded and surfaced for parking, roads, and material storage, and the erection of temporary structures for use during the construction phase. The O&M lay down area will serve as the central construction staging and fabrication area for the Proposed Project and will be approximately 20 acres in size. This construction task will only take place prior to and during Phase I.

Concrete foundations will be poured to support the permanent O&M building. The parking area will be of paved material or a rock aggregate. Until the Proposed Project becomes operational, the O&M building and associated structures will run on 3 to 4, 250-horsepower generators for temporary power.

Water Supply and Storage

Once the O&M building and temporary structures are built, a 150,000-gallon storage tank will be erected and the on-site active septic system will be connected to the O&M building waste system. The septic system will utilize a leach field and be engineered to EPA standards. Potable water treatment equipment, most likely Reverse Osmosis (RO), will be installed and connected to the on-site storage tank. The septic system will be designed in accordance with Clark County regulations and reviewed by the EPA to determine if further permitting under 40 CRF §144.25 is warranted.

The water treatment system will have to incorporate effluent waste discharge from the RO process. The waste discharge will comply with National Pollutant Discharge Elimination Systems (NPDES) and will operate under a permit. The RO process will accumulate approximately 4.2 AFY of discharge that will be temporarily held in an on-site evaporation pond properly sized for the Proposed Project's operations. Stormwater discharge will be diverted from the evaporation pond using earthen or rock aggregate berms.

### Substation and Switchyard Construction

After clearing, grubbing and grading, the substation area (approximately 15 acres in size) would be excavated to a maximum depth of 10 feet for large transformer foundations and switch gear. A copper grounding grid would be installed and the foundations for transformers and metal structures would be poured. The area(s) would be backfilled, compacted, and leveled. A 6-inch layer of aggregate would be uniformly distributed across the entire substation area.

Installation of the transformers, breakers, buswork, and metal dead-end structures would follow. A pre-fabricated Control House would be installed in the O&M building to house the electronic components required of the substation and switchyard equipment.

Switchyard construction would consist of site grading, concrete equipment foundations, crane placed electrical and structural equipment, underground and overhead cabling and cable termination, ground grid trenching and termination, control building erection, and installation of all associated systems including heating, ventilation, air conditioning, distribution panels, lighting, communications and control systems, and lightning protection.

### Transmission Line Poles

All structures for 230kV and 500kV line options will be constructed of either galvanized or weathering steel poles or lattice steel towers similar to what is currently used within the utility corridor (Figure 2-11). The final finish of the structures will be determined as part of the detailed design process. For both 230kV and 500kV options, tangent structures are recommended to be configured as H-frame or two-pole, while dead-end and angle structures are recommended to be constructed as three-pole designs. 12kV poles would be of wood and placed into pre-augured holes at a depth suitable for stability.

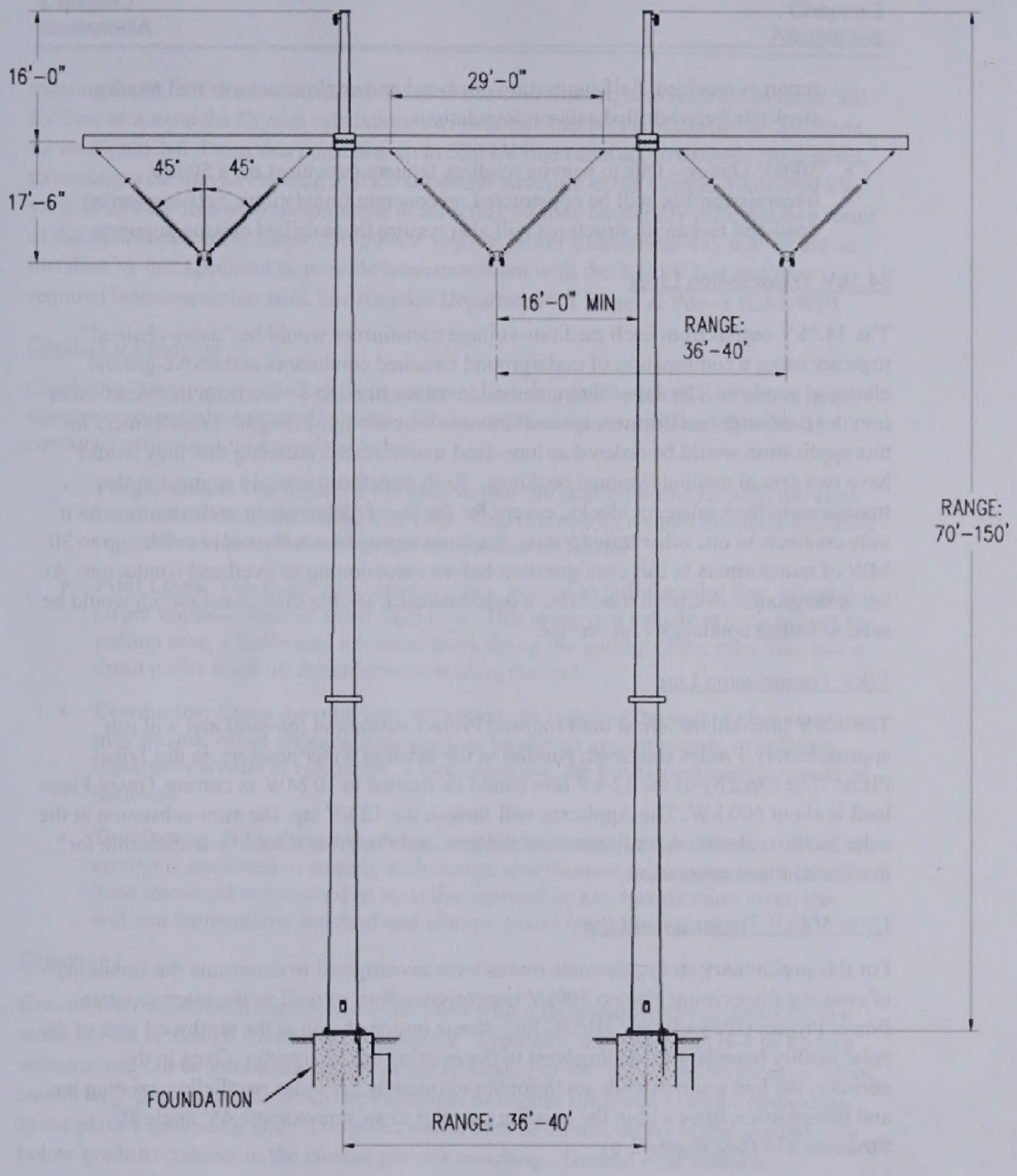
#### Pole Installation

Steel poles would be staged either in designated laydown/stringing area or would be delivered and unloaded adjacent to their designated final installation location.

Wood poles would be placed into drilled holes and lowered into place using a crane or backhoe. Wood poles would be embedded in the ground to a depth that satisfies the minimum requirements outlined within the Code of Clark County, Nevada. Installation of poles is anticipated to require auguring holes approximately 2 feet in diameter and 8-foot deep. Aggregate or high strength backfill would be used to stabilize the installed poles. One foundation hole is expected for each transmission line structure and directly embedded pole. Poles used for dead-end or turning would be supported by guy wires and anchors.

A detailed geotechnical specification would be required to provide the basis for foundation design for the project. It is expected that foundations for the project will be designed as steel-reinforced drilled concrete pier foundations. Steel reinforcement shall be in the form of Grade 60 reinforcing bars that conform to ASTM A615. Soil shall be tested for contamination as well as soluble sulfate and soluble chloride ion content as part of the geotechnical investigation to determine the type of cement to be used; however, experience in the project area has shown that concrete based on Type II cement should be adequate. Design compressive strength for steel-reinforced DCP foundations shall be a minimum of 4000 psi. Foundations required for each design option are discussed below:

- 230kV Option - Tangent structures will be directly embedded in the soil unless poor soil conditions or heavy loading conditions require steel reinforced concrete piers. The soil conditions will be determined after a geotechnical investigation


16'-0"
29'-0"
45°
45°
17'-6"
16'-0" MIN
RANGE: 36'-40'
RANGE: 70'-150'
FOUNDATION
RANGE: 36'-40'

NOTES:

1. ALL DIMENSIONS AND RANGES PROVIDED ARE TYPICAL IN NATURE AND NEED TO BE VERIFIED DURING DETAIL DESIGN.

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Typical 230kV or 500kV Transmission Line Structure

MALCOLM PIRNIE, INC.

September 2011

FIGURE 2-11

Map Document:Austin/6923001/GIS/MXD/EIS/Figure 2-6

report is received. Self supporting dead-end and angle structures will require steel-reinforced drilled caisson foundations.

- 500kV Option - Due to heavier loading, tangent structures for a 500kV transmission line will be constructed on concrete foundations. Self-supporting dead-end and angle structures will also require these drilled caisson supports.

## 34.5kV Transmission Lines

The 34.5kV output from each medium-voltage transformer would be "daisy-chained" together using a combination of underground trenched conductors and above-ground electrical conduit. The daisy-chain method involves running a wire from the transformer into the field with transformers spliced into this wire along its length. Transformers for this application would be ordered as loop-feed transformers, meaning that they would have two sets of medium-voltage bushings. Each transformer would connect to the transformers from adjacent blocks, except for the last transformer in each circuit, which only connects to one other transformer. Each underground circuit would collect up to 30 MW of transformers in this configuration before transitioning to overhead conductors. At the underground-overhead transition, a pole-mounted, visible disconnect switch would be used to isolate conductors for service.

## 12kV Transmission Line

The 12kV line will initiate at the Proposed Project substation (on-site) and will run approximately 3 miles southeast, parallel to the existing water pipeline, to the Tribal Plaza. The capacity of the 12 kV line would be limited to 10 MW as current Travel Plaza load is about 600 kW. The Applicant will furnish the 12 kV tap, the mini-substation at the solar facility substation, and protective devices, and the Tribe would be responsible for the Travel Plaza connection.

## Up to 500kV Transmission Line

For this preliminary study, alternate routes were investigated to determine the feasibility of crossing the existing Navajo 500kV transmission line, as well as the Intermountain Power Project (IPP) ±500kV HVDC line. Route options begin at the northwest side of the solar facility boundary extending west to the existing utility corridor. Once in the corridor, the line route extends south for approximately 2.7 miles paralleling existing gas and transmission lines within the existing corridor to an approximate 45° angle at Structure #10 (See Figure 2-6).

Both the 230kV and 500kV transmission line options have been studied. The 500kV option will require the replacement of the existing, dead-end lattice structure near Crystal substation in order to generate acceptable clearance for a new 500 kV line to cross underneath. From Structure #11, the route extends south along the west side of the existing BLM corridor to a structure location near the first angle in the McCullough 500 kV line as it exits the Crystal substation; this structure location is identified as Structure #2 on Figure 2-6. From this point, the up to 500 kV line turns approximately 90 degrees, extending west into an existing 500 kV dead-end structure in the Crystal South 500 kV yard. A 230 kV line termination angle at Structure #2 may be slightly different as a result of the final location for a new 230-500kV step-up power transformer bay that would be installed by the Applicant to provide interconnection with the 500 kV bus and the required interconnection with Los Angeles Department of Water & Power (LADWP).

Conductor Stringing

Conductor stringing would likely be done one phase at a time, with all equipment in the same operational place until all phases of that operation are strung. The sequence of conductor stringing is summarized below:

- **Finger Lines**: The finger line is used to pull the later pilot line through travelers installed on each davit arm. The finger line is typically a small diameter synthetic rope that can be pulled by hand or with a crawler tractor.
- **Pilot Lines**: The finger line, once in place, is used to pull the pilot line, which is a larger synthetic rope or small steel line. This requires a vehicle at each side of the pulling area, a Bullwheel tensioner truck doing the pulling of the pilot line, and a drum puller truck on the other side holding the reel.
- **Conductor**: Using the pilot line, the conductor is pulled through. Other activities may include offset clipping if suspension insulators are not plumb, or splicing together two reels of conductor. Once complete, the traveler equipment would be removed.
- **Tensioning**: After the conductor is completely strung through a section, the section is tensioned to comply with design specifications. Once the conductor has been tensioned or loosened to meet the appropriate sag specification given the ambient temperature, the dead-end clamps would be tightened.

Grounding

Ground rods would be hammered into the earth with a jackhammer device attached to a small bobcat or similar tractor type machinery. Typically, the rods come in 8 to 12-foot sections and can be joined if longer rods are needed. For the 34.5kV wood poles, a 3-foot square by 2-foot-deep area would be excavated to expose the ground rod for connection to the plant's grounding grid. The poles would then be connected by laying ground wire below grade to connect to the ground grid via trenching. Ground rods would be connected to the pole or, in the case of a steel pole, to the anchor bolts. The 500kV structures would be grounded independently.

## Solar Array Assembly and Construction

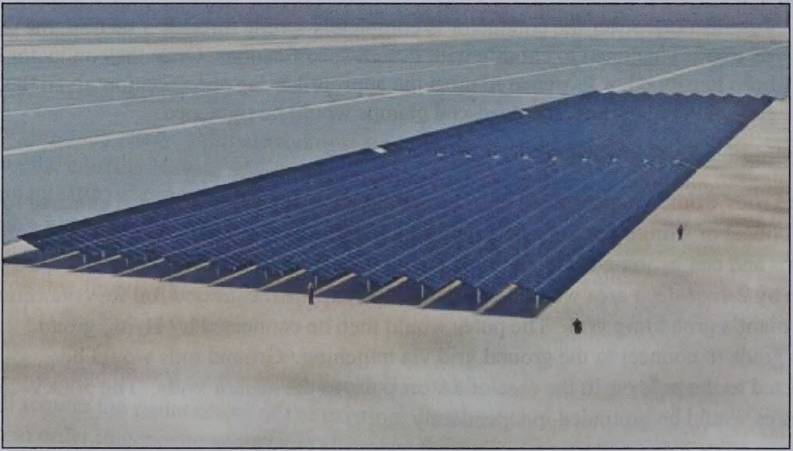
### Solar Field

Pre-assembly of solar arrays would be completed prior to delivery or finished in designated areas using tent structures described above. Assembled solar equipment would be installed on metal poles or on pre-cast concrete foundation and ballast systems to form a row of panels. Special trucks would be used to transport and complete assembly of PV panels in the field. Small mobile cranes may be used to lift, guide, and place structures into place. Trenchers would be used to bury connecting wires that lead to the transformers, where applicable. Other equipment that may be used to complete PV installation include welding machines, forklifts, and tractors.

### PV Equipment Installation

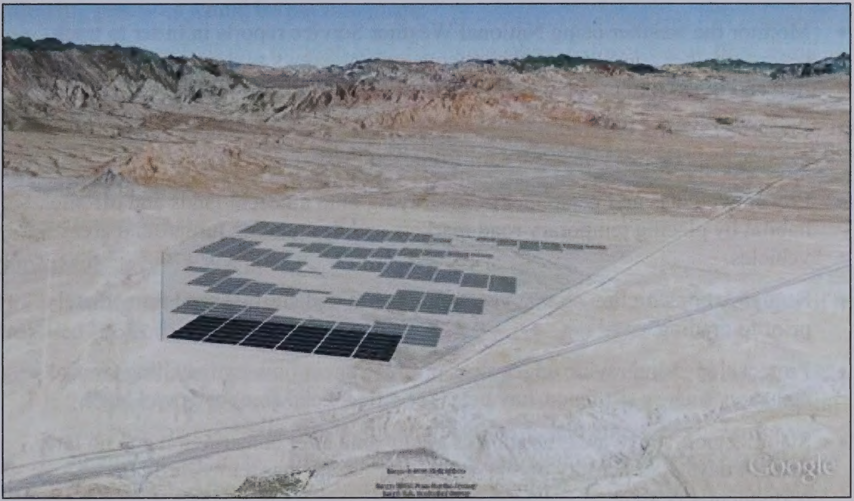
The solar field would be constructed in 0.5 MW (500 Kw) blocks (Figures 2-12 and 2-13). Each block would be approximately 280 feet by 10 feet and would contain 900 solar modules, a set of inverters, and a medium voltage transformer. Temporary laydown areas near each block would be used to finish assembly and erect the block. The sub-surface soil condition of the site is primarily composed of a thick layer of hard caliche, which is difficult to drill at thick layers. Therefore, vertical fixed tilt and tracker poles will be installed using a direct drill and placement with cementing materials or pre-cast ballasts where drilling is not practical. Drilled holes 6 to 8-foot deep would be completed using track or tired vehicle drilling rigs.

**Figure 2-12: PV Layout Example**



The inverter/transformer concrete equipment pad would be poured to provide a mounting surface for the equipment. A set of inverters and a three-phase transformer would be installed on the foundation pads and would contain the necessary enclosures to protect the equipment from adverse environmental conditions. Once all equipment is inspected, all PV modules would be wired into the inverters and transformers via appropriate conductor transfer mediums.

**Figure 2-13: Typical Layout Rendering**



Cable Trenching

Prior to any trenching, shrub and scrub would be removed. Trenches would be a minimum of 12-inches wide and up to 3-foot deep, depending on the number of conductors and voltage of equipment, to comply with local electrical code. Prior to cable installation, the trenches would be back-filled with the appropriate materials to provide suitable bedding for conductors, and then covered with 3 to 4 inches of sand. The remaining backfill would be composed of native, excavated material. Excess soil would be redistributed onsite or used to provide level foundations for other equipment such as inverters and transformers.

Drainage Control Structures

Engineered drainage controls will be installed throughout the Proposed Project site, including the main access road along the utility corridor. These controls will allow existing water flow patterns to remain and maintain natural sediment transport and flow speeds through and off the site. All drainage controls will be engineered within the guidelines set forth in the Code of Clark County, Nevada.

### 2.6.7. Other Considerations for Construction of the Proposed Project

#### Erosion and Sediment Control Measures

The Applicant would use BMPs to protect the soil surface and frequent watering to control wind erosion. As part of the Proposed Project the Applicant would implement the following erosion control measures during construction and in the SWPPP:

- Monitor the weather using National Weather Service reports in order to track severe weather conditions and alert construction crews to the onset of significant rain and high wind events.
- Preserve existing vegetation, as much as practicable, and conduct clearing and grading only in areas necessary for Proposed Project activities.
- Prevent vehicles and personnel from straying onto adjacent lands and off-site habitat by placing temporary road markers and designating turnaround areas for vehicles.
- Sequence construction so that vegetation is left undisturbed until immediately prior to grading.
- Protect slopes and ravine edges susceptible to sheet flow by installing control measures such as silt fence, hay bales (certified weed-free) or gravel bags.
- Stabilize non-active areas as soon as practicable after construction and no later than 14 days after activity on that portion of the site has temporarily or permanently ceased.
- Place covers over stockpiled dirt prior to storm or high wind events. Place silt fence or hay bales (certified weed-free) around stock piles to prevent erosion during rain events.
- Construction gabions of stone and wire and place within drainages at engineered locations to minimize flow velocity and sediment transport downstream.
- Maintain sufficient erosion control measures on-site in conformance with the EPA National Pollution Discharge and Elimination System General Permit (Region 9) as outlined in the SWPPP.
- Promptly repair any BMPs after significant storm events or when failure is evident.

A combination of the following erosion controls should be used at the site under all stormwater conditions:

- Activities scheduled to avoid high wind and rainfall events;
- Existing vegetation preserved (to the extent practicable);

- Use of mulch (certified weed-free) during post construction (hydraulic, straw, etc);
- Use of geotextiles and mats;
- Use of earthen dikes or drainage swales;
- Use of velocity dissipation devices or structures; and
- Use of ravine or channel bank stabilization / slope drains.

To minimize sediment load into the existing ravines and ephemeral desert washes, the following practices would be put into place:

- Design catch basins for high load discharge areas; redirect heavy flow using earthen berms to a defined detention basin, if required;
- Construct rock weirs or energy dissipating devices within the ephemeral washes to decrease downstream silt and sediment transport and decrease velocity of flow to prevent increased erosion to the existing channel.

### Construction Waste

Nonhazardous Solid Waste

The following nonhazardous waste streams would be generated from construction of the Proposed Project:

- **Paper, Wood, Glass, and Plastics**. During construction, approximately 180-250 tons of paper, wood, glass, and plastics would be generated from shipping and packing materials, waste lumber, insulation, and empty nonhazardous chemical containers. This waste would be recycled to the greatest extent practicable. All other nonhazardous waste would be disposed of weekly at a local landfill. On-site waste would be placed in dumpsters with lids to avoid wind pollution.
- **Metal**. Approximately 5 tons of metal, including steel from welding and cutting, packaging, and empty nonhazardous containers would be generated during construction. All metal/aluminum waste would be recycled where practicable. All waste not recycled would be transported to a municipal landfill.

The nearest landfill to the Proposed Project is the Apex Class 1 landfill located approximately 12 miles south near the Highway 93 intersection, and Wells Cargo Landfill in Las Vegas, Nevada a Class III Industrial Waste landfill.

Wastewater

Wastewater generated during the construction phase would include sanitary waste, equipment washdown water, and potentially stormwater or runoff from dust control maintenance. The Proposed Project does not include a wastewater treatment facility during the construction phase; however, the Applicant would handle and dispose of hazardous and non-hazardous wastewater in accordance with applicable laws and regulations.

Hazardous Waste

Most of the hazardous waste generated during construction would be in the form of solvents, lubricants or flushing and cleaning fluids during the drilling process or welding and pipe structure preparation. The quantity of hazardous waste is thought to be minimal. Empty hazardous containers would be re-used, returned to vendor for recycling or disposed of at an industrial landfill. Sanitary waste from portable toilets would be removed by a contracted sanitary service. Other hazardous material such as oily rags, spent lube containers, spent lead acid batteries, or waste oil would be disposed of at a permitted Treatment, Storage and Disposal Facility (TSDF).

### Spill Prevention, Control, and Countermeasures Plan

A Spill Prevention, Control, and Countermeasures Plan (SPCC) (Appendix E) would be developed in accordance with state and federal regulations to reduce environmental impacts resulting from spill of petroleum products. The SPCC would outline measures taken to prevent spills, control spills, and report any spill as required by state and federal regulations. All stored chemicals, including vehicle fuels, will be stored within approved containers and be placed on appropriately-sized secondary containment structured to capture and control potential leaks or spills.

### Emergency Response Plan

An Emergency Response Plan would be prepared for the Proposed Project. The plan would contain the results of a comprehensive facility hazard analysis, and for each identified hazard, a response plan. Emergencies may include major injuries or fatalities of construction personnel, wildfires, brush or equipment fires, hazardous spills or leaks, attempted sabotage, or other identified possibilities. The Plan would also identify personnel and assign roles and actions to first responders and would designate response actions.

### Health and Safety Program

The Applicant will require all construction and operation subcontractors to operate under a health and safety program that is approved by OSHA, the Tribe and BIA/BLM industry standards. While the use of petroleum products and hazardous materials is not a major component of the Proposed Project, the Health and Safety Program should include a standard indemnification and Hold Harmless HazMat stipulations for use of BLM ROW and access to Reservation land. Stipulations and requirements should be in place to notify the BLM and Tribe in the event of a release of hazardous substances or petroleum products.

### Site Restoration and Revegetation Plan

The Proposed Project facilities have a lease term of 35 years after which the Applicant could apply for a lease extension of up to 50 (15 additional) years and upgrade or decommission the solar electric generation facility. In the event that the Proposed Project is decommissioned, the Applicant would implement a Site Restoration Plan (Appendix F) to restore the area to pre-construction conditions as much as practicable. The Restoration Plan would cover the following topics:

- Goals and objectives for the Plan;
- Methods of rehabilitation;
- Assessment methods and criteria to determine restoration success;
- Monitoring of restoration;
- Noxious weed and invasive species control;
- Annual reporting of restoration progress; and
- Restoration implementation and monitoring schedule.

The Restoration Plan would be implemented immediately after decommissioning and after disturbed areas are no longer needed and deemed safe for initiation of restoration measures.

## 2.7. Proposed Project Operation and Maintenance

### 2.7.1. Operations Workforce

The operations and maintenance of the Proposed Project would employ approximately 35 full-time positions as seen in Table 2-6.

**Table 2-6.**
**Operational Workforce**

| Worker Title | Quantity | Comments |
|---|---|---|
| General Manager | 1 | Overall Manager of Operations (P&L accountability) |
| Plant/Performance Engineer, EHS | 1 | Plant Engineer with EHS Responsibilities |
| Power/Controls Engineer | 1 | Responsible for switchyard, inverters, 34.5 kV ac collection |
| Maintenance Supervisor | 1 | Manager of all maintenance personnel |
| Water Truck Operators | 2 | Daily dust control & grounds maintenance |
| Module PV Cleaning Operators | 12 | Clean all PV and SunCatcher modules |
| PV Maintenance Technicians | 8 | Preventive maintenance & repairs for PV arrays |
| Machinist | 1 | Responsible for providing machine support |
| Instrument & Controls -Lead | 1 | Highly-skilled supervisor, computer skills |
| Instrument & Controls Technicians | 2 | Controls systems and collection systems wiring |
| General Administration | 2 | Maintains building, water treatment plant |
| Security/Misc. | 3 | Maintains building and grounds (possibly outsourced) |
| Total | 35 | |

Maintenance and administrative staff would typically work an 8-hour day, Monday through Friday. During times of major repair, the maintenance workforce would typically work longer hours and/or weekends and holidays. This workforce would be stationed at the proposed O&M building.

### 2.7.2. Operation and Maintenance Activities

There are few moving parts to the PV single tracker systems as well as no process water, gas, or fuels required for power generation. Maintenance would consist of dust control and grounds upkeep, cleaning and repair of modules, repair and upkeep of all transformers, inverters and wiring collection systems, control systems upkeep, building maintenance and water treatment, and permanent stormwater controls and maintenance.

Maintenance and equipment inspections would be completed in accordance to the recommendations of the Original Equipment Manufacturer (OEM) requirements. Routine Preventative Maintenance (PM) activities will be scheduled in accordance to the frequencies outlined in the OEM specifications. O&M would require the use of vehicles and equipment including but not limited to welding, re-fueling, lubricating, panel washing equipment, forklifts, manlifts, and chemical sprayers for weed abatement. Flatbed trucks and pick-up trucks as well as utility vehicles would be used on a daily basis at the facility and on-site.

Major equipment maintenance and overhauls would be completed at intervals of approximately 5-10 years. Replacement of non-functioning equipment may require the use of heavy haul transport equipment and large overhead cranes.

#### Water Use

Annual water consumption during the operations phase of the completed project is estimated at 20 to 40 AFY. The solar facility would not require process water for electric generation; however, potable water would be needed at the O&M building. The majority of the water would be used for cleaning PV panels (estimated at 13.53 AFY) at an anticipated frequency of four times per year.

#### Vegetation Management

Vegetation would be maintained at a maximum height of 12 inches around the PV modules and O&M building to facilitate fire risk management. Vegetation maintenance will be conducted using mechanical equipment or approved chemical control.

#### Nonhazardous Solid Waste

The Operations phase of the Proposed Project would produce nonhazardous wastes in the form of oily rags, spent lubricant containers, broken or rusted machine parts, defective electrical equipment, refuse generated by on-site staff and miscellaneous solid waste. The quantity of general facility waste is estimated at 30 tons per year. This waste would be properly disposed of at Apex Class 1 landfill located approximately 12 miles south near the Highway 93 intersection, and Wells Cargo Landfill in Las Vegas, Nevada a Class III Industrial Waste landfill. All non-hazardous liquid waste (i.e., used oils and lubricants) will be recycled where applicable and/or disposed of at approved off-site landfills.

### Nonhazardous Wastewater

Source water for panel washing would be high in sulfur and carbonate and require treatment prior to use through a RO system. RO wastewater discharge, estimated at 4.2 AFY, would accumulate in the on-site evaporation pond. The evaporation pond would be protected by bird netting or similar measure to ensure no avian impacts. All solid RO discharge waste will be properly transported to an approved off-site landfill. The Proposed Project would also generate on-site domestic water and sanitary sewer waste from the O&M building. Although Clark County does not have jurisdiction on the Reservation, this sanitary wastewater would be discharged to a properly designed septic tank and leach field system designed to meet the specifications of Clark County.

### Hazardous Materials and Hazardous Waste

The following hazardous materials would be kept on-site at the O&M building:

- Mineral insulating oil (transformers)
- Hydraulic fluid
- Welding gas (acetylene, oxygen, and argon)
- Herbicide (Roundup® or equivalent)
- Diesel and unleaded fuel.
- Propane (only if propane forklifts are used)

An SPCC Plan would be developed and implemented for the life of the Proposed Project. The Plan would be developed in accordance with Tribal, BLM, and Clark County regulations. The Plan would contain preventative measures, control measures, and reporting protocols in case of a hazardous spill.

## 2.8. Proposed Project Decommissioning

In order to ensure that the permanent closure of the Proposed Project would not have an adverse affect, a Facility Decommissioning Plan would be developed and approved by the BIA, BLM, and Tribe prior to decommission. The Plan would address future land use plans, removal of infrastructure and hazardous materials, impacts and mitigations relevant to closure, equipment to remain on-site, and discuss the conformance with applicable regulatory requirements and Tribal Ordinance. Decommissioning would be consistent with requirements outlined in the Site Restoration Plan. The implementation of the Decommissioning Plan will be the responsibility of the owner of the solar facility.

During decommissioning, Proposed Project components would be removed from site and recycled where applicable. Dependent upon future use of the site, some of the facility equipment may be left on the site such as the O&M building, RO wastewater treatment facility, electric transmission lines, and roads. The extent of the closure activities would be determined at the time of decommission in accordance with Tribal needs. Potential closure activities may include:

- Removal of solar panels and supports;
- Removal of foundations;
- Removal of underground cabling and electric infrastructure;
- Removal of inverters and transformers;
- Disposal of chemicals and hazardous waste;
- Removal of site fencing;
- Restoration of original site contours; and
- Revegetation of areas disturbed by closure activities in accordance with the Site Restoration Plan.

## 2.9. Federal, State and Local Permitting

If the Proposed Project is approved by the BIA and BLM, the Applicant would be required to obtain permits and other authorizations from federal and state regulatory agencies prior to construction (Section 1.4). The draft lease provides that "all Tenant Work shall be constructed in accordance with all building, construction and/or safety requirements (including, without limitation the Building Code, Electrical Code, Plumbing Code, Mechanical Code and Solar Energy Code) set forth in the Code of Clark County, Nevada which would be applicable to the Project if it were constructed under the jurisdiction of Clark County, Nevada."

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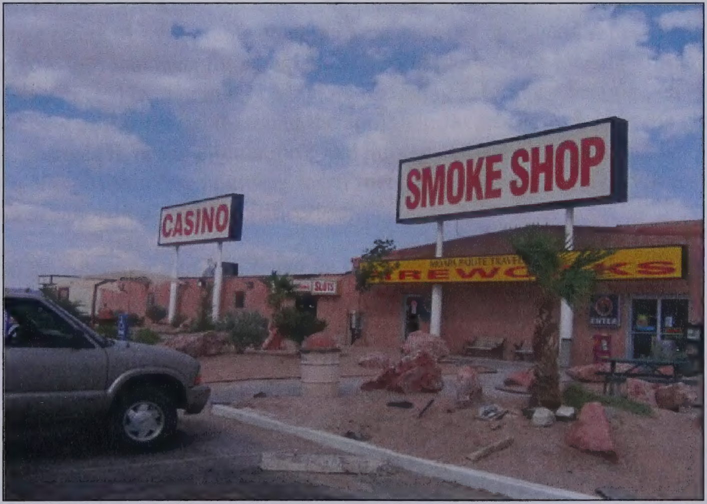
# 3. Affected Environment

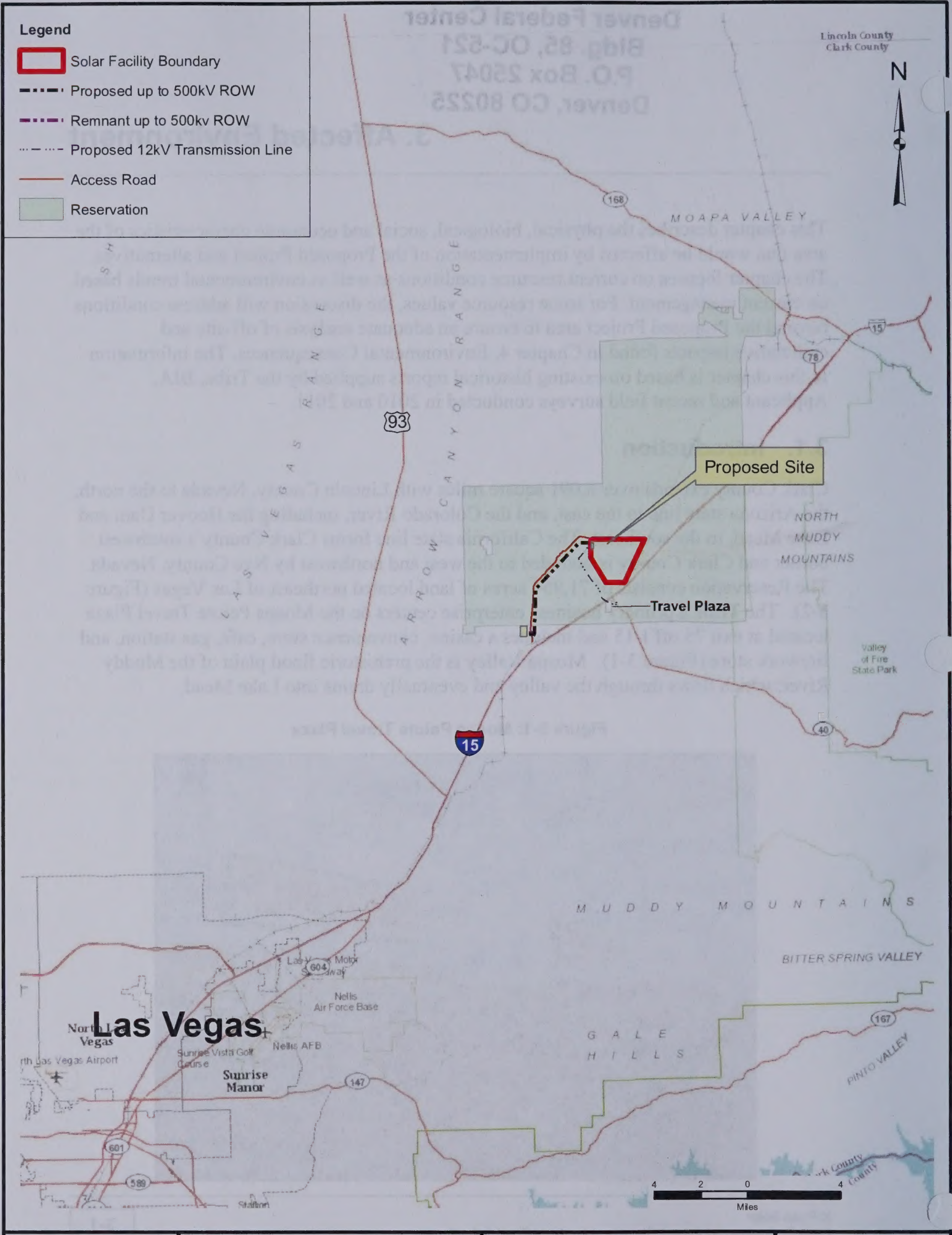
This chapter describes the physical, biological, social and economic characteristics of the area that would be affected by implementation of the Proposed Project and alternatives. The chapter focuses on current resource conditions as well as environmental trends based on current management. For some resource values, the discussion will address conditions beyond the Proposed Project area to ensure an adequate analysis of off-site and cumulative impacts found in Chapter 4, Environmental Consequences. The information in this chapter is based on existing historical reports supplied by the Tribe, BIA, Applicant and recent field surveys conducted in 2010 and 2011.

## 3.1. Introduction

Clark County extends over 8,091 square miles with Lincoln County, Nevada to the north, the Arizona state line to the east, and the Colorado River, including the Hoover Dam and Lake Mead, to the southeast. The California state line forms Clark County's southwest border and Clark County is bounded to the west and northwest by Nye County, Nevada. The Reservation consists of 71,954 acres of land located northeast of Las Vegas (Figure 3-2). The Tribe's primary business enterprise centers on the Moapa Paiute Travel Plaza located at exit 75 off I-15 and includes a casino, convenience store, cafe, gas station, and firework store (Figure 3-1). Moapa Valley is the prehistoric flood plain of the Muddy River, which flows through the valley and eventually drains into Lake Mead.

**Figure 3-1: Moapa Paiute Travel Plaza**




Legend
🟥 Solar Facility Boundary
Proposed up to 500kV ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Access Road
🟩 Reservation
Lincoln County
Clark County
N
MOAPA VALLEY
168
93
15
78
40
ARROW CANYON RANGE
LAS VEGAS RANGE
Proposed Site
NORTH MUDDY MOUNTAINS
Travel Plaza
Valley of Fire State Park
MUDDY MOUNTAINS
BITTER SPRING VALLEY
GALE HILLS
167
PINTO VALLEY
Las Vegas Motor Speedway
604
Nellis Air Force Base
Nellis AFB
Las Vegas
North Las Vegas
North Las Vegas Airport
Sunrise Vista Golf Course
Sunrise Manor
147
601
589
Clark County
4 2 0 4
Miles

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Proposed Project Location

MALCOLM PIRNIE, INC.

February 2012

FIGURE 3-2

## 3.2. Climate

The Mojave Desert is a transitional desert between the hot Sonoran Desert to the south and the cold Great Basin Desert to the north. The climate of the Mojave Desert is characterized by extreme fluctuations of daily temperatures, strong seasonal winds, and clear skies. Within Clark County, this region of the Mojave Desert exhibits typical subtropical arid climate. During the summer months of June through September, average daytime highs range from 94 – 104 °F (34 to 40°C) with nighttime lows ranging from 69 – 78°F (21–26°C) (Western Regional Climate Center 2009). There are an average of 133 days per year that exceed 90°F (32°C) and 72 days that exceed 100 °F (38°C ). Extreme temperatures occur most often during July and August. Humidity is often under 10 percent. On average, sunny days are recorded 85 percent of the time (Gorelow 2005); there are approximately 300 sunny days per year. Annual rainfall is roughly 4.2 inches.

The winter season is generally mild and of shorter duration than summer. Average daytime highs are 60 °F (16°C) with nighttime lows around 40 °F (4°C). Although temperatures can sometimes drop to freezing, 32 °F (0°C), rarely do the nighttime temperatures dip below 30 °F. Snowfall occurs in the surrounding mountains, but is rare in the valley. There are no wind data for this area, but data from Las Vegas International Airport (40 miles south) show winds averages 7 miles per hour (mph) (Western Regional Climate Center 2009). Local summer storms during July and August are the source of most summer precipitation and snowmelt that occur west of the site at the higher mountain elevations.

### 3.2.1. Climate Change

Climate change refers to any notable change in measures of climate (temperature, precipitation or wind) that lasts for an extended period (decades or longer). Climate change may be affected by a number of factors including natural cycles (e.g., changes in the sun's intensity or Earth's orbit around the sun); natural processes within the climate system (e.g., changes in ocean circulation); and human activities that change the atmosphere's composition (e.g., burning fossil fuels) or land surface (e.g., deforestation, reforestation, urbanization, and desertification).

According to the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report, increased atmospheric levels of $CO_2$ are correlated with rising temperatures. Concentrations of $CO_2$ have increased by 31 percent above pre-industrial levels since 1750. The IPCC concluded in a statement released February 2, 2007, that "the widespread warming of the atmosphere and ocean, together with ice-mass loss, support the conclusion that it is extremely unlikely that global climate change of the past 50 years can be explained without external forcing, and very likely that it is not due to known natural causes alone" (Intergovernmental Panel on Climate Change 2007). Further, a recent report from the U.S. Global Change Research Program (USGCRP) concludes, that "the global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases" (U.S. Global Change Research Program 2009).

### 3.2.2. Potential Effects of Climate Change

According to the Nevada Climate Change Advisory Committee (NCCAC) Final Report (Nevada Climate Change Advisory Committee 2008), projected changes in climate would impact public health through: (1) the direct effects of heat and frequent heat waves; (2) exacerbated air pollution as increased ground level ozone; (3) increases in infectious diseases, such as dengue fever and malaria; and (4) a decrease in general public health due to economic/social changes from climate change.

According to the EPA, scientists have already observed changes due to climate change including a rise in sea level, shrinking glaciers, changes in the range and distribution of plants and animals, trees blooming earlier, lengthening of growing seasons, ice on rivers and lakes freezing later and breaking up earlier, and thawing of permafrost (USEPA 2010). Scientists are also studying how societies and the Earth's environment will adapt to or cope with climate change.

In the United States, scientists believe that most areas will continue to warm, although some will likely warm more than others. It remains very difficult to predict which parts of the country will become wetter or drier, but scientists generally expect increased precipitation and evaporation, and drier soil in the middle parts of the country.

### 3.2.3. Existing Greenhouse Gas Emissions

According to the *Nevada Statewide Greenhouse Gas Inventory and Projections, 1990-2020* (updated in December 2008) and EPA's *Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2005,* greenhouse gas emissions in Nevada accounted for approximately 56.3 Million Metric Tons (MMT) of gross $CO_2$ equivalent ($CO_2$ e) emissions in 2005, an amount equal to 0.8 percent of total U.S. gross GHG emissions. Nevada's gross GHG emissions increased approximately 65 percent from 1990 to 2005, while total U.S. GHG emissions rose by only 16.3 percent during this period. Rapid population growth has been the most important driver in emissions grown in Nevada.

Electricity generation and transportation were the two sectors responsible for the majority of the growth in GHG emissions during the last eighteen years. GHG emissions are expected to increase at a more rapid rate during the projection period, to a total of 78.4 MMT $CO_2$e by 2020, due to increased fossil fuel electricity production. The next largest contributor to emissions are the residential, commercial, and industrial fuel use sectors.

### 3.2.4. Federal Greenhouse Gas Guidance

The Council on Environmental Quality (CEQ) issued guidance to federal agencies on February 18, 2010, regarding GHG emissions. The guidance states that in an agency's analysis of direct effects of GHG emissions, it would be appropriate to quantify cumulative emissions over the life of the Proposed Project, discuss measures to reduce emissions, including consideration of reasonable alternatives, and qualitatively discuss the link between such emissions and climate change. The CEQ recommends that if a Proposed Project would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of $CO_2e$ GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision-makers and the public. The guidance also states that it is not currently useful for the NEPA analysis to attempt to link specific climatological changes to a particular project or emissions, as direct linkage is difficult to isolate and to understand.

## 3.3. Topography, Geology and Geologic Hazards

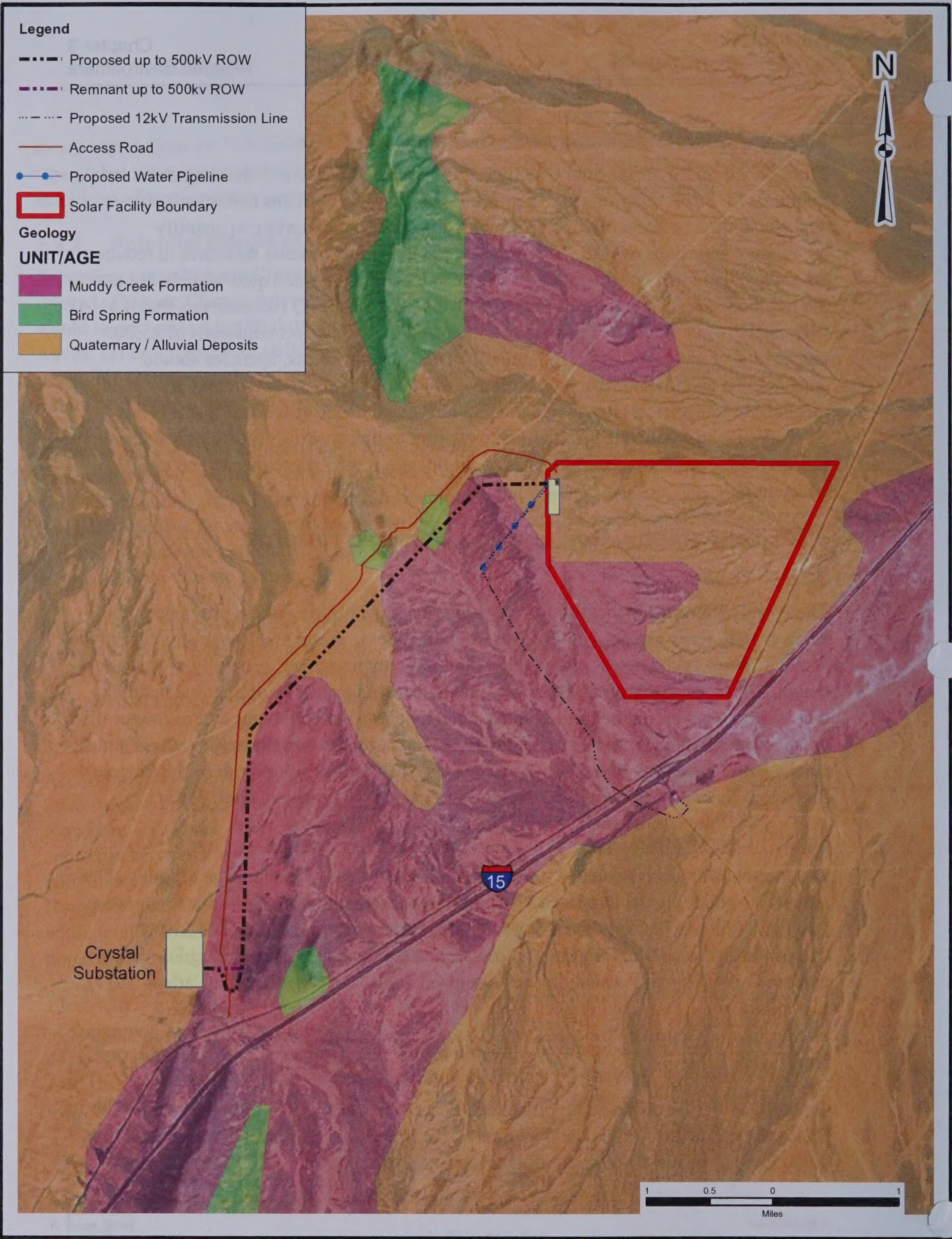
### 3.3.1. Topography

The Proposed Project is located in the Basin and Range physiographic province in the north central portion of the Mojave Desert upon a mesa. Basin and Range structure in the Mojave Desert is characterized by rather abrupt mountain ranges, generally of moderate height. The topography of the Basin and Range consists primarily of exposed bedrock that is deeply cut by ravines and is surrounded by aprons of pediments and/or low-profile bajada slopes, which drain to interior closed basins. This interior drainage with no outlets results in the formation of evaporite playa lakes, such as Dry Lake south of the Proposed Project, in the valley bottoms (Benson and Darrow 1981; Longwell et al. 1965).

### 3.3.2. Land Forms

The Proposed Project is situated on a mesa in the north end of the Dry Lake Valley. The mountains bounding the Dry Lake Valley include the Arrow Canyon Range to the west, Dry Lake Range to the south and North Muddy Mountains to the east. The Arrow Canyon Range is composed primarily of carbonate rocks of the Bird Spring Formation that are Ordovician to Permian in age (Longwell et al. 1965; Stewart and Carlson 1977). Elevations of the Proposed Project range from approximately 2,038 feet at the intersection of the main Proposed Project access road at Interstate Highway 15 to 3,089 feet (Figure 3-3).

Outcrops of the Tertiary-age Muddy Creek Formation are exposed throughout the valley. Based on well drillers' logs, the thickness of the Muddy Creek Formation is greater than 4,000 feet on the mesa northeast of the Proposed Project.


Legend
Proposed up to 500kV ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Access Road
Proposed Water Pipeline
Solar Facility Boundary
Geology
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Muddy Creek Formation
Bird Spring Formation
Quaternary / Alluvial Deposits
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Moapa River Indian Reservation
Geology of the Proposed Project

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February 2012
FIGURE 3-3

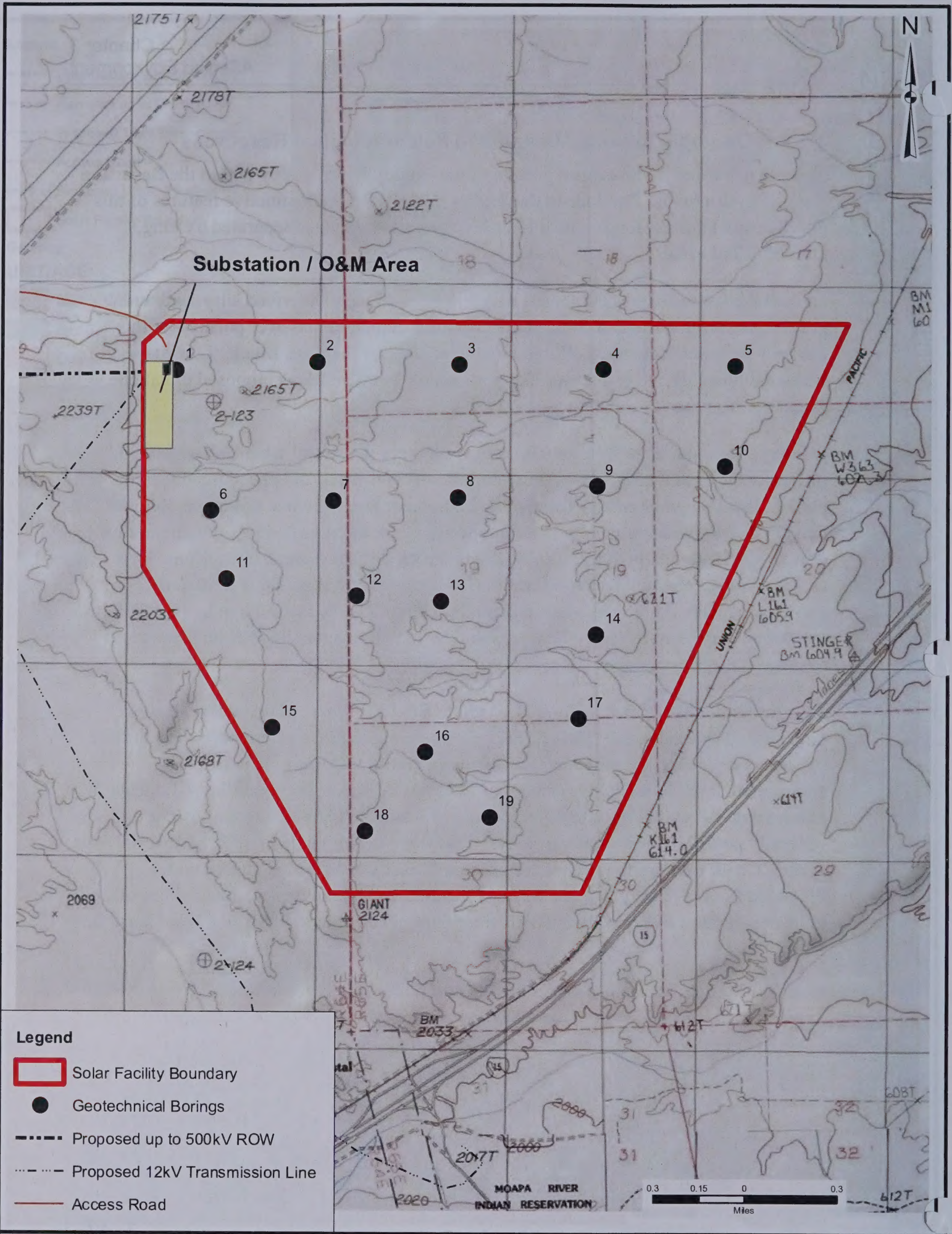
### 3.3.3. Geologic Setting, Mineral and Paleontological Resources

The site is located in the central portion of the Muddy River Valley within the Basin and Range Physiographic Province in the southwestern U.S. The distinctive features of this province are isolated, longitudinal fault-block mountain ranges separated by long, alluvial-filled basins.

Overall the site surface is composed of a thin layer of locally derived silty sand with gravel that forms a 1 to 2-foot-thick cover within drainages and over portions of the calcium carbonate cemented alluvium (caliche) capped plateaus. Much of the exposed surface of the elevated or plateau-like portions of the site is also composed of caliche. Site minerals have no economic value.

Site exploration indicates the caliche is dense to very dense and when excavated, with difficulty, generates silty, clayey sand with gravel consisting of approximately 20 to 30 percent low to high-plasticity fines, 40 to 50 percent fine to coarse sand, and 30 to 40 percent fine to medium angular to subrounded gravel, often including gray, medium, gravel-sized rounded pebbles of metavolcanic rock or brown angular mudstone liths. The caliche typically exhibits a strong reaction to hydrochloric acid and is frequently gypsiferous with visible lath-shaped crystals. The caliche cap appears to be thinner in the southwest portion of the site where exposure within drainages suggests an average thickness of approximately 10 to 15 feet.

Near the center of the site, drilling at borehole BP-13 (Figure 3-4) revealed a caliche thickness of approximately 13 feet. Seismic modeling in the northern portion of the site suggests very dense deposits, including caliche in that area, may be as much at approximately 40 feet thick; however, this has not been verified by drilling. Beneath the caliche cap and within the site drainages are exposures of fine-grained mudstone and generally poorly indurated silty or clayey sandstone of the Muddy Creek Formation. The Muddy Creek Formation is generally excavated easily where encountered on the Proposed Project. Ground water was not encountered during exploration and is expected to lie at a depth well below that which would affect construction (Black Eagle Consulting January 2011).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BM L161 605.9
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● Geotechnical Borings
-·-·- Proposed up to 500kV ROW
··-··- Proposed 12kV Transmission Line
— Access Road

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Geotechnical Boring Locations

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FIGURE 3-4

#### 3.3.3.1. Paleontological Resources

The Proposed Project is located in Quaternary alluvium (Longwell, et. al 1965) deposited by flowing water. The source rock units vary in type and age and many units are potentially fossiliferous (fossil-bearing). Potential paleontological materials are unlikely to exist in the alluvium. As the Proposed Project is underlain by alluvial deposits that are not known to have produced a substantial body of significant paleontological materials, the Proposed Project is categorized as low potential for paleontological resources.

### 3.3.4. Geologic Hazards

#### 3.3.4.1. Seismicity

Much of the Western United States is a region of moderate to intense seismicity related to movement of crustal masses (plate tectonics). By far, the most active regions, outside of Alaska, are in the vicinity of the San Andreas Fault system of western California. Other seismically active areas include the Wasatch Front in Salt Lake City, Utah, which forms the eastern boundary of the Basin and Range physiographic province, and the eastern front of the Sierra Nevada Mountains, which is the western margin of the province. The Proposed Project lies within Dry Lake Valley in the central portion of the Basin and Range physiographic province which is an area subject to periodic earthquake shaking. The USGS (2007) reports 80 earthquakes of magnitude 4.0 or greater have occurred within 100 miles of the site since 1973. Of these, only 12 were of magnitude 5.0 or greater and none exceeded magnitude 5.6. It must be recognized that there are probably few regions in the United States not underlain at some depth by older bedrock faults. Even areas within the interior of North America have a history of strong seismic activity.

The Proposed Project lies within an area with a moderate to high potential for strong earthquake shaking. Seismicity within the area is considered about average for the central Basin and Range Province (Ryall and Douglas 1976). The USGS indicates there is a 40 percent chance of a magnitude 5.0 or greater earthquake near the Proposed Project in the next 50 years.

#### 3.3.4.2. Faults

An earthquake hazards map is not available for the Proposed Project. The closest mapped fault is the California Wash Fault that forms prominent scarps in Quaternary alluvial fan sediments along the western flank of the Muddy Mountains, approximately 5 miles east of the site (USGS, 1991). The California Wash Fault is described as a "listric, concave to the west, northeast striking, down to the west normalfault," which forms the structural separation between bedrock of the Muddy Mountains and Tertiary basin fill within Dry Lake Valley (Anderson 1999). The California Wash Fault has demonstrable Quaternary movement but possible Holocene movement has yet to be investigated. Early to middle Pleistocene scarps have been tentatively mapped crossing the Proposed Project, striking approximately north along the boundary between Ranges 64 East and 65 East (USGS 1991). No surface manifestation of faulting was apparent during site exploration activities and the most recent movement of these faults, if they exist in the subsurface, is on the order of 130,000 to 1.5 million years before present.

The Nevada Earthquake Safety Council (NESC 1998) has developed and adopted the criteria for evaluation of Quaternary age earthquake faults. Holocene Active Faults are defined as those with evidence of movement within the past 10,000 years (Holocene time). Those faults with evidence of displacement during the last 130,000 years are termed Late Quaternary Active Faults. A Quaternary Active Fault is one that has moved within the last 1.6 million years. An Inactive Fault is a fault without recognized activity within Quaternary time (last 1.6 million years). Holocene Active Faults normally require that occupied structures be set back a minimum of 50 feet (100-foot-wide zone) from the ground surface fault trace. An Occupied Structure is considered a building, as defined by the International Building Code, which is expected to have a human occupancy rate of more than 2,000 hours per year.

Recurrence intervals for Nevada earthquakes along faults that have been studied are estimated to be in the range of 6,000 to 18,000 years in western Nevada (Bell 1984). The very active eastern boundary faults of the Sierra Nevada Mountains may have a shorter recurrence interval of 1,000 to 2,000 years. Many of the smaller faults may be the result of one-time events in response to movement along a better developed and more active fault system a considerable distance away.

Based on the geologic map, the California Wash Fault, approximately 5 miles east of the site, is considered to be Quaternary Active.

The set back from Quaternary Active Faults is left to the judgment of the geologist/engineer; however, no Critical Facility is permitted to be placed over the trace of a Late Quaternary Active Fault. A Critical Facility is defined as a building or structure that is considered critical to the function of the community or the project under consideration. Examples include, but are not limited to, hospitals, fire stations, emergency management operations centers and schools. Since no faults are mapped as crossing the site and none were suggested by the geotechnical investigation, adequate setbacks exist for the Proposed Project structures from known faults (Black Eagle Consulting January 2011).

### 3.3.4.3. Ground Motion and Liquefaction

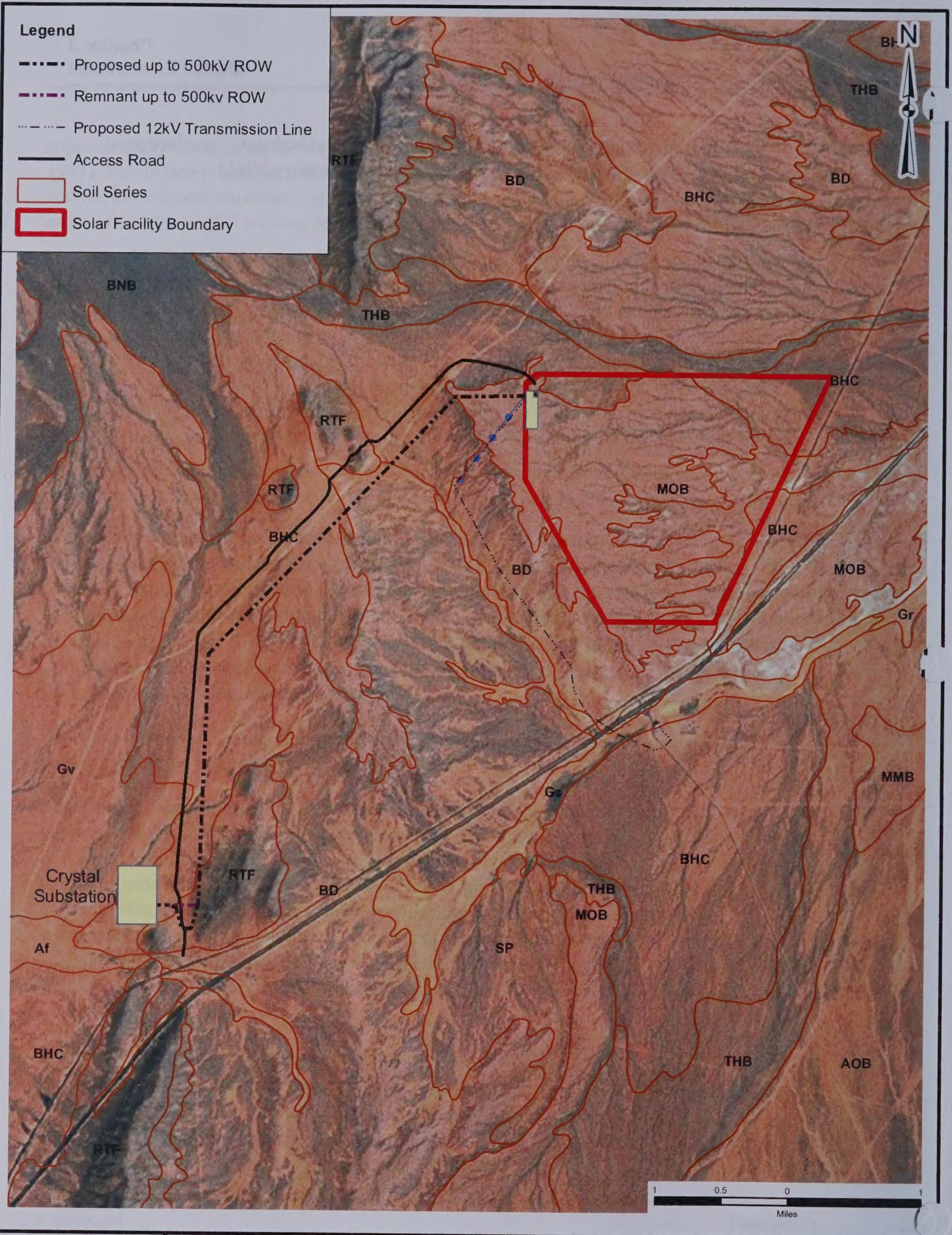
Mapping by the USGS (2007) indicates that there is a 2 percent probability that a bedrock ground acceleration of 0.29g will be exceeded in any 50-year interval. Only localized amplification of ground motion would be expected during an earthquake. Because the site area is underlain by dense to very dense caliche soils and bedrock, liquefaction potential is negligible at the site (Black Eagle Consulting January 2011).

## 3.4. Soils

The poorly developed soils, almost completely absent in some areas, are mostly clayey sands, usually with abundant caliche-coated rocks present. Site soils are generally shallow, rarely in excess of 18 inches in depth, even in areas away from the base of the mountains, and are typically about 4 inches in depth over an underlying caliche layer. Near the base of the Arrow Canyon Range the valley fills give way to bedrock pediment and eventually to an abrupt upward change in slope at the base of the core of the mountain where benched outcrops of sedimentary facies are exposed. On the core of the mountain, shallow soils are typically present only in small areas where the gradient is less steep.

### 3.4.1. Soil Series

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey maps (USDA NRCS 2006) were used to determine the soil information for the property and surrounding area. Tonopah Gravel, Bard Gravel, Badland, and Mormon Mesa are the soil series found on the Proposed Project (Figure 3-5). Engineering properties for the soil series are found in Table 3-1.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Remnant up to 500kv ROW
Proposed 12kV Transmission Line
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Soil Series of the Proposed Project

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FIGURE 3-5

### Table 3-1:
### Soil Series Engineering Properties

| Soil Series | Moist Bulk Density (g/cc) | Saturated hydraulic conductivity (um/sec) | Available water Capacity (In/in) | Erosion factors | | | Wind erodibility Group | Surface Runoff | Risk of Corrosion | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Kw | Kf | T | | | Uncoated Steel | Concrete |
| Badland | n/a | n/a | n/a | n/a | n/a | n/a | n/a | Very High | High | High |
| Bard Gravel | 1.4-1.55 | 14-42 | 0.06-0.13 | 0.20 | 0.37 | 1.00 | 5 | Very High | High | Low |
| Mormon Mesa | 1.4-1.6 | 14-42 | .07-0.15 | 0.15 | 0.28 | 1.00 | 6 | Very High | High | Low |
| Tonopah Gravel | 1.55-1.7 | 14-42 | .03-.09 | 0.05 | 0.32 | 5 | 8 | Low | High | Low |

Source: NRCS 2006

#### 3.4.1.1. Tonopah Series (THB)

The Tonopah series consists of very deep, excessively to well-drained soils that formed in mixed alluvium. Tonopah soils are on fan remnants and fan piedmonts. Slope ranges from 0 to 15 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 65 degrees F. The present vegetation is mainly creosotebush and white bursage.

#### 3.4.1.2. Bard Series (BHC)

The Bard series consists of shallow over cemented material, well-drained soils that formed in alluvium derived predominantly from limestone and dolomite with some sandstone and quartzite. The Bard soils are on dissected valley fill terraces, alluvial fans and fan remnants. Slope ranges from 0 to 15 percent. The mean annual precipitation is about 5 inches and the mean annual air temperature is about 62 degrees F. The vegetation is mainly creosotebush, white bursage, annual buckwheat, cholla, and other cacti.

#### 3.4.1.3. Badland Series (BD)

The Badland series consists of severely eroded and gullied sideslopes of the mesa. It is made of exposures of the Muddy Creek Formation. The Formation consists of highly stratified sand, silt, and clay that contain a large amount of gypsum and calcium carbonate. Slopes are commonly 15 to 50 percent, but can be as much as 100 percent in some areas. Run-off is very rapid, and the hazard of water erosion is very high. This unit is described as generally eroded and barren of vegetation.

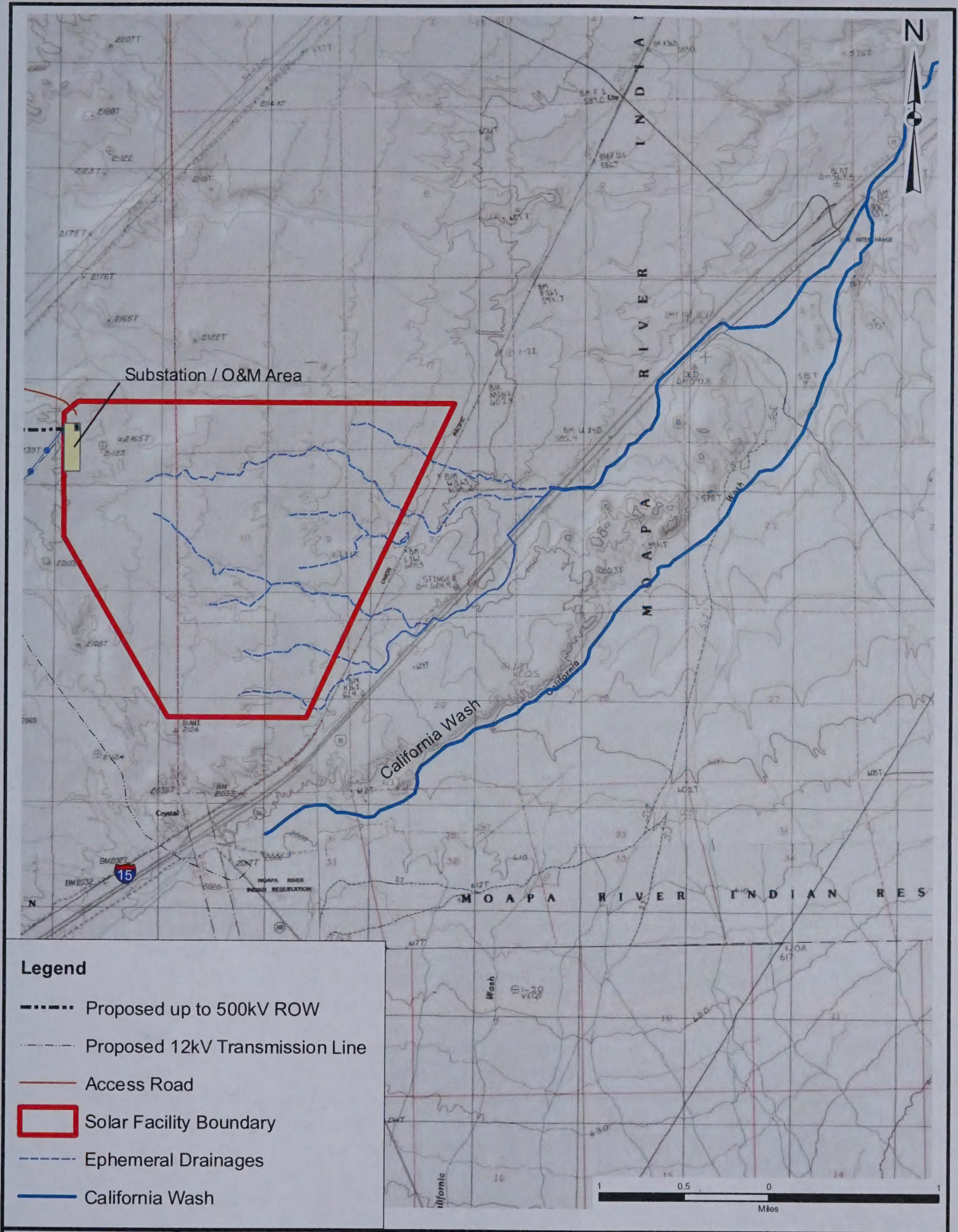
#### 3.4.1.4. Mormon Mesa Series (MOB)

The Mormon Mesa series consist of shallow over petrocalcic, well drained soils that formed in material influenced by calcareous loess over mixed alluvium from predominantly limestone sources. The Mormon Mesa soils are on summits of fan remnants and mesas. Slope ranges from 0 to 15 percent. The mean annual precipitation is about 5 inches and the mean annual temperature is about 65 degrees F. The vegetation is scattered white bursage, yucca, and creosotebush with some big galleta and Indian ricegrass.

## 3.5. Water Resources

### 3.5.1. Surface Water

A field survey of the 2,000-acre solar facility conducted in December 2010 identified five interconnected ephemeral washes ranging in width from 3 to 7 feet (Figure 3-6). The channels of these washes lacked a continuous bed and bank and had little variation in vegetation from the adjacent areas. In addition, the sandy-gravel substrate was consistent on the adjacent areas. These washes all drain into the California Wash located approximately 5 miles east of the site on the east side of I-15. The Proposed Project does not contain or drain to a wild and scenic river (Wild & Scenic River Council 2009). None of the washes found on-site fall within the FEMA 100-year floodplain.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Substation / O&M Area
California Wash
MOAPA RIVER INDIAN RES
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Proposed up to 500kV ROW
Proposed 12kV Transmission Line
Access Road
Solar Facility Boundary
Ephemeral Drainages
California Wash

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Moapa River Indian Reservation
Water Resources and Ephemeral Washes

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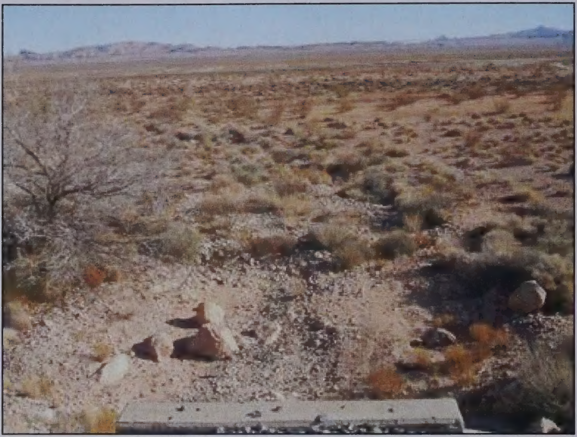
September 2011

FIGURE 3-6

**Figure 3-7: Example Ephemeral Wash and Drainage – East Side of Proposed Facility Note the lack of bed and bank (looking west from on site drainage).**



### 3.5.2. Surface Water Quality

The EPA regulates water quality on Tribal lands under Section 401 of the Clean Water Act. The Nevada Department of Environmental Protection (NDEP) has set water quality standards, however not applicable on Tribal lands, contained in the Nevada Administrative Code (NAC) 445A.119-445A.225 defining the water quality goals for important water bodies by designating uses of the water and by setting criteria necessary to protect beneficial uses and prevent degradation. Additionally, Section 303(d) of the Clean Water Act (CWA) requires the NDEP to develop a list of impaired water bodies needing additional work beyond existing controls to achieve or maintain water quality standards. There are no perennial waterbodies in the Proposed Project and there is no surface water quality data available for Proposed Project washes. The Proposed Project does not contain, nor is a direct tributary to, any waterbodies that are on Nevada's 303(d) list for exceeding state water quality standards (Nevada Division of Environmental Protection 2009). The Muddy River, located approximately 12 miles northeast of the Proposed Project, is considered impaired and is on the 303(d) list (See Figure 1-2).

For the Muddy River, NDEP developed site-specific numeric standards for pH, dissolved oxygen, maximum temperature, phosphorous, nitrite, nitrate, turbidity, total dissolved solids, color, and E. coli to protect the designated beneficial uses and to maintain existing water quality. From its spring source to Glendale, designated beneficial uses for the Muddy River include irrigation, stock watering, recreation not involving contact with the water, industrial supply, municipal or domestic supply, propagation of wildlife, and propagation of aquatic life.

California Wash is not an impaired, 303(d) listed water body, and, therefore, does not have a numeric water quality standard. Instead, California Wash has a general narrative standard, which applies to all streams in Nevada, that the waters be maintained to be free from various pollutants including those that are toxic.

### 3.5.3. Ground Water

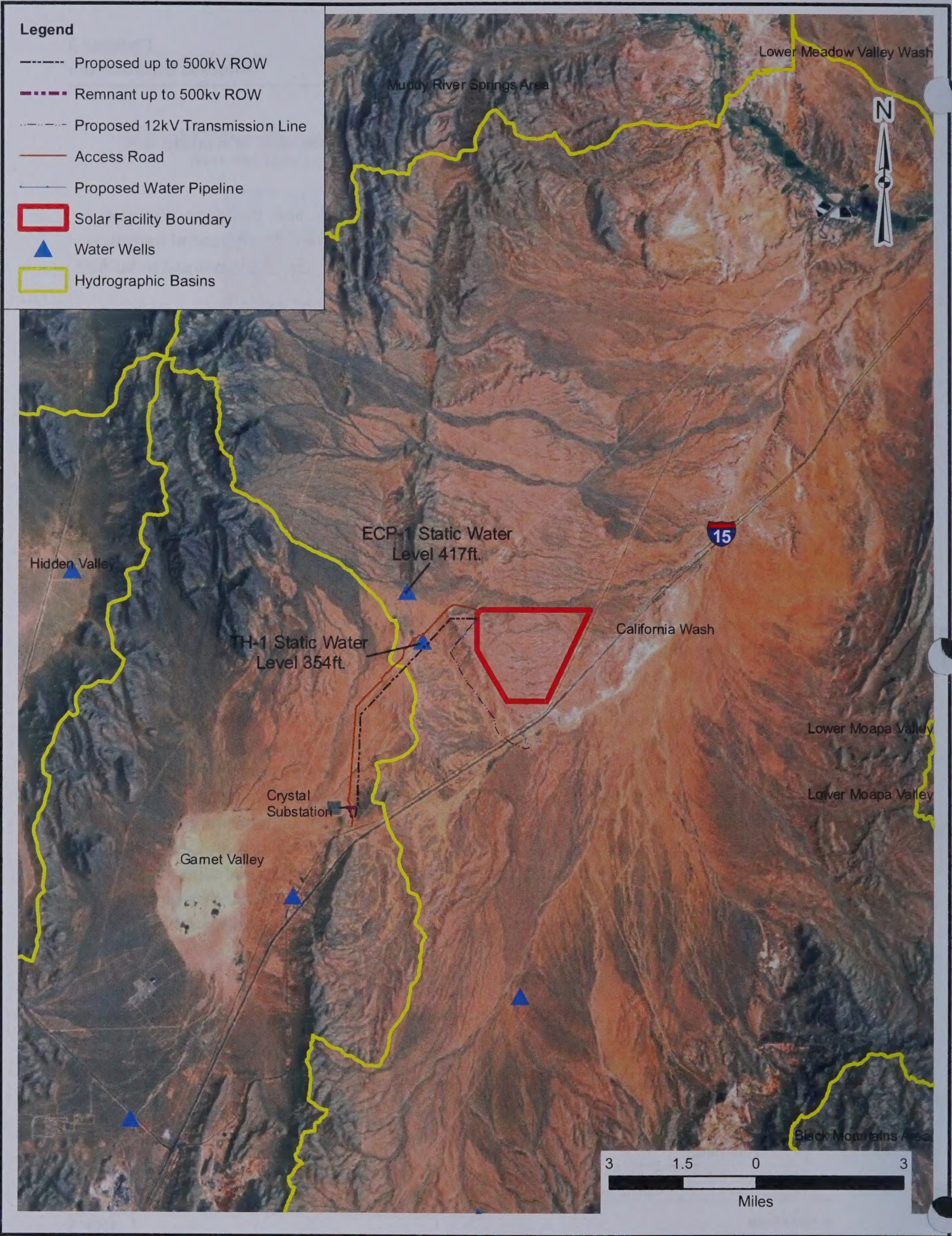
The Proposed Project is in the Colorado River Basin Region of Nevada's Hydrographic Regions. The Colorado River Basin is one of the larger hydrographic regions in Nevada, covering 5,612 square miles and includes 27 hydrographic areas. The Proposed Project is located in and around the area called Arrow Canyon Range Cell. The hydrogeology of the Arrow Canyon Range Cell is recognized as unique yet poorly understood in terms of detailed documentation. Seven groundwater management basins are superimposed on the Arrow Canyon Range field. The Arrow Canyon Range Cell is composed of a series of north-south trending structural blocks related to extensional faulting that are almost entirely composed of Paleozoic carbonate rock (Mifflin 2001). As mentioned earlier, the Proposed Project is located within the California Wash hydrographic basin, which is an unconsolidated sand and gravel aquifer (Figure 3-8). Table 3-2 provides the area, perennial yield, and committed resources for this groundwater basin as well as information on a neighboring basin.

The basin is a westward-thickening section of Paleozoic carbonate rocks, in part unconformably overlain by generally fine-grained sediments of the Muddy Creek Formation (Longwell et al. 1965; Bohannon 1983). The carbonate-rock terrain that constitutes the Arrow Canyon Range Cell incorporates both recharge areas and one major spring discharged area, and is bounded by generally less permeable basin or bedrock lithologies. The California Wash Basin around the Proposed Project is around 5,000 feet thick (Mifflin 1998, 2001). Regional patterns of precipitation combined with terrain elevation results in the highest mountain ranges receiving the majority of precipitation that becomes recharge. The carbonate terrain is efficient in retaining a relatively high percentage of precipitation as recharge.

**Table 3-2.**
**Groundwater Basin Characteristics**

| Groundwater Basin | Area (Square miles)[1] | Perennial Yield (acre-feet/year) | Committed Resources[2] | |
|---|---|---|---|---|
| | | | Acre-Feet/Year | Designated |
| Garnet Valley | 156 | 400 | 3413.20 | Yes |
| California Wash | 318 | 2,200 | 3067.51 | Yes |

Source: NDWR 1992; S. Walmsely (pers. comm. 2010)
Notes: (1) Area for Nevada portion of basin only. (2) As of July 1992


Legend
Proposed up to 500kV ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Access Road
Proposed Water Pipeline
Solar Facility Boundary
Water Wells
Hydrographic Basins
Lower Meadow Valley Wash
Muddy River Springs Area
N
ECP-1 Static Water Level 417ft.
15
Hidden Valley
TH-1 Static Water Level 354ft.
California Wash
Lower Moapa Valley
Lower Moapa Valley
Crystal Substation
Garnet Valley
Black Mountains Area
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Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

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Groundwater Basin Type and Water Well Locations

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FIGURE 3-8

Groundwater data from several Reservation monitoring and test wells were found for the Proposed Project (Figure 3-8). These wells are within 5 miles of the Proposed Project and their static water level range in depth from 354 to 526 feet below the surface, with wells yielding over 1,000 gallons per minute (gpm; Mifflin 2001). Pump and step-drawdown testing of the carbonate aquifer yielded a range of transmissivity of 50,000 to 100,000 ft/day, hydraulic conductivity of 20 ft/day and specific yield (Sy) of 0.03 to 0.008 (Mifflin 2001). The TH-1 well is the primary well for the Proposed Project.

#### 3.5.3.1. Ground Water Quality

Groundwater quality in the hydrologic basins of the Mojave Desert in California and Nevada is generally acceptable for most uses of groundwater; however, since many of the basin-fill aquifers have closed surface drainage and limited inter-basin flow, aquifers may contain poor quality, saline waters, elements from natural geothermal activity, and contaminants from mining or energy operations (BLM 2009a). Groundwater in the California Wash is generally high in salinity and the water from the Proposed Project well is also high in sulfate. The Total Dissolved Solids (TDS) range between 750 to mid 900 mg/L. The sulfate level from one of the well samples was at 290 mg/L.

### 3.5.4. Water Rights

The Reservation was permitted 2,500 AFY groundwater right in 1989 by the State Engineer (Mifflin 2001) and in a Memorandum of Agreement with Southern Nevada Water Authority and other parties in April 2006 (Moapa Paiute Water Settlement Agreement 2006). It is also permitted with 3,500 AFY of surface water from Muddy River. The Tribe's water rights are permitted for "municipal" use. Usually in order to use Nevada State water rights for an energy project the permitted use must be industrial. Nevertheless, because the Tribe is a government it can act as a municipality and provide water throughout the Reservation much like a water district; thus, a change in use of the water is not required (Marty Mifflin, personal communication, February 2011).

The Applicant, through the pending lease with the Tribe, may use up to 50 AFY from Reservation's permitted water rights during the normal operation of the Proposed Project, but additional water is available for purchase during the construction phase.

### 3.5.5. Jurisdictional Waters, Drainages, and Riparian Areas

As stated earlier, the Proposed Project does not contain or drain to a wild and scenic river and there are no perennial water bodies within the Proposed Project. The Applicant received an approved jurisdictional determination (JD) from the U.S. Army Corps of Engineers (USACE) on July 1, 2011 (Appendix K). The USACE will not assert jurisdiction over any of desert washes located within the solar facility boundary. Jurisdictional waters outside of the solar facility and potentially impacted along the associated ROWs would be permitted through the USACE under Section 404 of the Clean Water Act.

## 3.6. Air Quality

This section identifies existing air quality and climatic conditions within and adjacent to the Proposed Project. Information in this section is largely based on calculations for mechanized equipment to be used.

### 3.6.1. Existing Ambient Air Quality

The Proposed Project is in Clark County, Nevada. As defined by Clark County regulations (Section O – Definitions), the county is divided into separate airshed regions synonymous with hydrographic areas (HAs). The Proposed Project is located within HA 218 (California Wash). Air quality is regulated by the U.S. Environmental Protection Agency (EPA) on tribal lands. Pursuant to the Clean Air Act (CAA), the EPA has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants. These criteria air pollutants are sulfur dioxide (SO2), nitrogen dioxide (NO2), particulate matter with a mean aerodynamic diameter of 10 micrometers or less (PM10), particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less (PM2.5), carbon monoxide (CO), ozone ($O_3$), and lead. Formation of $O_3$ is controlled via regulation of volatile organic compounds (VOCs) and oxides of nitrogen (NOx), which are precursors for the formation of ozone. Primary standards set limits to protect public health, including the health of "sensitive" populations including individuals with respiratory diseases, children, and the elderly. Secondary standards set limits to protect the environment, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Ozone is not emitted directly from emission sources, but is created at near-ground level by a chemical reaction between nitrogen oxide (NOx) and VOCs in the presence of sunlight. As a result, NOx and VOCs are often referred to as $O_3$ precursors and are regulated as a means to prevent ground-level $O_3$ formation. Criteria air pollutant descriptions and health effects are summarized in Table 3-3.

### Table 3-3.
### Major Criteria Air Pollutant Descriptions and Health Effects

| Pollutant | Description and Health Effects |
|---|---|
| Ozone - $O_3$ | High $O_3$ levels result from VOC and NOx emissions from vehicles and industrial sources, in combination with daytime wind flow patterns, mountain barriers, a persistent temperature inversion, and intense sunlight. Health effects include:<br>- Aggravation of respiratory and cardiovascular diseases;<br>- Impairment of cardiopulmonary function; and<br>- Eye irritation. |
| Nitrogen Dioxide - $NO_2$ | $NO_2$ emissions are primarily generated from the combustion of fuels. Health effects include:<br>- Risk of acute and chronic respiratory disease. |
| Sulfur Dioxide - $SO_2$ | $SO_2$ is produced when any sulfur-containing fuel is burned. Natural gas contains trace amounts of sulfur, while fuel oils contain much larger amounts. Health effects include:<br>- Aggravation of respiratory disease;<br>- Reduced lung function; and<br>- Eye irritation. |
| Particulate Matter -$PM_{10}$ and $PM_{2.5}$ | Particulates in the air are caused by a combination of wind-blown fugitive or road dust, particles generated from fuel combustion in motor vehicles and industrial sources, residential and agricultural burning, and from the reaction of $NO_x$, sulfur oxides ($SO_x$), and organics. Health effects include:<br>- Aggravation of respiratory disease;<br>- Reduced lung function;<br>- Cough irritation; and<br>- Lung irritation. |
| Lead - Pb | Lead gasoline additives, non-ferrous smelters, and battery plants were historically significant contributors to atmospheric lead emissions. Legislation has since reduced lead emissions. Health effects include:<br>- Impairment of central nervous system. |
| Volatile Organic Compounds - VOCs | A portion of total organic compounds or gases, excluding methane ($CH_4$), ethane, and acetone (due to low photochemical reactivity). These compounds are regionally important due to their involvement in the photochemical reaction that produces $O_3$. Health effects include:<br>- Impairment of central nervous system;<br>- Eye, nose, and throat irritation; and<br>- Fatigue, headache, confusion, and dizziness. |

The current State of Nevada and federal ambient air quality standards are identified in Table 3-4.

## Table 3-4.
## State and Federal Ambient Air Quality Standards

| Pollutant | Averaging Time | Nevada Standards | Federal Standards (NAAQS) | |
|---|---|---|---|---|
| | | | Primary | Secondary |
| CO | 8-Hour Average[1] | 9 ppm (10 mg/m$^3$) | 9 ppm (10 mg/m$^3$) | -- |
| | 1-Hour Average[1] | 35 ppm (40 mg/m$^3$) | 35 ppm (40 mg/m$^3$) | -- |
| Lead | Rolling Quarterly Average | 1.5 $\mu g/m^3$ | 1.5 $\mu g/m^3$<br>Rolling 3-Month Average[2] – 0.15 $\mu g/m^3$ | Same as Primary |
| $NO_2$ | Annual Arithmetic | 0.053 ppm (100 | 53 ppb[3] | Same as Primary |
| | 1-Hour Average[4] | -- | 100 ppb | -- |
| $PM_{10}$ | Annual Arithmetic | 50 $\mu g/m^3$ | -- | -- |
| | 24-Hour Average[5] | 150 $\mu g/m^3$ | 150 $\mu g/m^3$ | Same as Primary |
| $PM_{2.5}$ | Annual Arithmetic | 15 $\mu g/m^3$ | 15 $\mu g/m^3$ | Same as Primary |
| | 24-Hour Average[7] | 65 $\mu g/m^3$ | 35 $\mu g/m^3$ | Same as Primary |
| $O_3$ | 8-Hour Average | 0.008 ppm (157 $\mu g/m^3$) | 0.075 ppm (2008)[8]<br>0.08 ppm (1997)[9] | Same as Primary |
| | 1-Hour Average[10] | 0.12 ppm (235 | 0.12 ppm | Same as Primary |
| $SO_2$ | Annual Arithmetic | 0.03 ppm (80 | 0.03 ppm | 3-Hour Average – 0.5 ppm |
| | 24-Hour Average[1] | 0.14 ppm (365 $\mu g/m^3$) | 0.14 ppm | |
| | 3-Hour Average | 0.50 ppm (1300 | 1-Hour – 75 ppb[11] | |

Sources: EPA, Clark County 2004

Notes:

1. Not to be exceeded more than once per year.
2. Final rule signed October 15, 2008.
3. The official level of the annual $NO_2$ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
4. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
5. Not to be exceeded more than once per year on average over 3 years.
6. To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$
7. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).
8. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (Effective May 27, 2008)
9. (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard – and the implementation rules for that standard – will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(c) EPA is in the process of reconsidering these standards (set in March 2008).

10. (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under the standard ("anti-backsliding").
(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.

11. (a) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

### 3.6.1.1. Air District Significant Thresholds

The Clark County Department of Air Quality and Environmental Management (DAQEM) uses the national ambient air quality standards to determine the potential impacts of a Proposed Project. Additional requirements for both construction and operation are in place to manage emissions of fugitive dust (including the subsets of PM10 and PM2.5). Any approved construction or new significant source of stationary (point) air pollution in Clark County would be required by DAQEM to adhere to the prescribed best management practices (BMPs) and control measures in order to minimize dust emissions and control engine exhaust emissions.

As stated in the previous section, the Proposed Project is located within HA 218 (California Wash). Vehicle traffic associated with Proposed Project would occur on I-15 between the Proposed Project and Las Vegas, Nevada. In addition to HA 218, this section of I-15 would also pass through HA 212 (Las Vegas Valley) and 216 (Garnet Valley).

Table 3-5 describes the attainment status of regulated criteria air pollutants within these hydrographic areas.

Table 3-5.
**Attainment Status of Hydrographic Areas (Clark County, Nevada)**

| Pollutant | Hydrographic Area 212 | Hydrographic Area 216 | Hydrographic Area 218 |
|---|---|---|---|
| $O_3$ | Attainment | Non-Attainment | Non-Attainment* |
| CO | Maintenance** | Attainment | Attainment |
| $NO_x$ | Attainment | Attainment | Attainment |
| $SO_2$ | Attainment | Attainment | Attainment |
| $PM_{10}$ | Non-Attainment | Attainment | Attainment |
| $PM_{2.5}$ | Attainment | Attainment | Attainment |

Note: *Non-attainment area for HA 218 excludes the Moapa River Indian Reservation; the proposed site will be located within this reservation. Attainment areas are those areas meeting state and federal air quality standards. Non-attainment areas are areas where the air quality was measured or determined by the state regulatory agency as not meeting the state and federal air quality standards.
** Maintenance areas are those geographic areas that had a history of nonattainment, but are now consistently meeting the National Ambient Air Quality Standard (NAAQS).

As noted in the table above, in addition to particulate matter, parts of Clark County have also been designated as nonattainment for $O_3$ and maintenance for CO.

Portions of Clark County (near Las Vegas), including HAs 164A, 164B, 165, 166, 167, 212, 213, 214, 216, 217, and 218 but excluding the Reservation and the Fort Mojave Indian Reservation, are designated as nonattainment for the federal 8-hour $O_3$ standard. The Phase I Implementation Rule issued by EPA on June 15, 2004, classified these parts of Clark County as a "basic" nonattainment area under Subpart 1 of the CAA. Clark County was an attainment area for the previous 1-hour $O_3$ standard. In June 2007, the United States Court of Appeals for the District of Columbia Circuit vacated the Phase 1 Implementation Rule, thus obligating Clark County to develop an early progress plan to meet its transportation conformity budgets. The Subpart 1 areas in the "Green" book (EPA's air pollutant website) are listed as "Former Subpart 1" until the reclassification of the areas is finalized. Proposed reclassifications were published on January 16, 2009. A state implement plan (SIP) for $O_3$ has not yet been developed. However, DAQEM is preparing a maintenance plan under the requirements of the 1997 O3 8-hour standard of 0.08 parts per million (ppm). In March 2008, EPA promulgated a new $O_3$ standard of 0.075 ppm.

### 3.6.1.2. General Federal Actions

The General Conformity Rule requires federal agencies to ensure that their actions (including permitting of projects) conform to the applicable SIP. Given that the Proposed Project takes place almost entirely on Reservation land, the applicable SIP may only apply to that portion on BLM lands. The EPA has full authority over new sources constructed on tribal lands. 40 CFR 49 and 51 "Review of New Sources and Modifications in Indian Country" was recently promulgated and issued on July 1, 2011. This rule provides a formal mechanism for requiring permitting of stationary sources throughout Indian Country. A discussion and summary of regulated air pollutant emissions from the Proposed Project is included in Section 4.1 of this EIS.

DAQEM conducts monitoring of regulated criteria air pollutants by utilizing ambient air quality measurements in an established air monitoring system located throughout Clark County. Table 3-6 describes air quality concentrations for regulated criteria air pollutants in the Proposed Project vicinity. Table 3-7 shows the concentrations measured at existing monitors in Clark County (closest in proximity to the Proposed Project) that have measured air quality concentrations above state and federal air quality standards. These tables include data from the closest monitoring stations to the Proposed Project; the monitors are located in North Las Vegas and Las Vegas, Nevada. Since there are no monitors in the immediate vicinity of the Proposed Project, the closest monitors have been evaluated and those considered to be somewhat representative have been selected.

## Table 3-6:
## Regional Background Air Quality Concentrations in the Proposed Project Area

| Location | Measured Air Quality Concentrations[a,i] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $PM_{10}$ ($ug/m^3$) | | $PM_{2.5}$ ($ug/m^3$) | | $SO_2$ ($ug/m^3$) | | | | CO (ppm) | | $NO_2$ (ppm) | | Ozone (ppm) | |
| | Annual[h] | 24-hour[e] | Annual[h] | 24-hour[f] | Annual[h] | 24-hour[e] | 3-hour[e] | 1-Hour[e] | 8-hour[e] | 1-hour[e] | Annual[h] | 1-hour[h] | 8-hour[g] | 1-hour[h] |
| North Las Vegas, Clark County, Nevada[b] | 22 | 97 | 4.05 | 10.2 | – | – | -- | – | -- | -- | – | – | 0.093 | 0.114 |
| Las Vegas, Clark County, Nevada[c] | – | -- | – | -- | – | – | -- | – | – | -- | 0.008 | 0.049 | -- | – |
| Las Vegas, Clark County, Nevada[d] | – | -- | – | -- | 0.006 | 0.008 | 0.009 | 0.011 | 4.7 | 5.5 | – | – | – | -- |

Notes:

a. Based on review of monitoring data from calendar years 2004 through 2008.
b. Data from Monitor Site ID 320030022 (Site Address: NE of City – 12101 Hwy 93/I15).
c. Data from Monitor Site ID 320030075 (Site Address: 6651 W. Azure Ave.).
d. Data from Monitor Site ID 320030539 (Site Address: 4001 East Sahara Avenue).
e. 2nd highest concentration measured during a single calendar year.
f. 98th percentile of concentrations measured during a single calendar year.
g. 4th highest concentration measured during a single calendar year.
h. 1st highest concentration measured during a single calendar year.
i. NAAQS – $PM_{10}$ (24-hour – 150 $ug/m^3$); $PM_{2.5}$ (Annual – 15 $ug/m^3$, 24-hour – 35 $ug/m^3$);
$SO_2$ (Annual – 0.03 ppm, 24-hour – 0.14 ppm, 1-hour – 0.075 ppm);
CO (8-hour – 9 ppm, 1-hour – 35 ppm); $NO_2$ (Annual – 0.053 ppm, 1-hour – 0.100 ppm);
$O_3$ (8-hour 2008 std – 0.075 ppm, 8-hour 1997 std – 0.080 ppm, 1-hour – 0.12 ppm).

## Table 3-7.
## Exceedances of Air Quality Standards and Existing Maximum Concentrations near the Proposed Project Area

| Year | Ozone (ppm)[a,e] | | | CO (ppm)[b] | | $NO_2$ (ppm)[a,e] | | $SO_2$ (ppm)[b,e] | | | | $PM_{10}$ (ug/m$^3$)[a] | | | $PM_{2.5}$ (ug/m$^3$)[a,e] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1st Max 1-hr | 4th Max 8-hr | Days Over Std. | 2nd Max 1-hr | 2nd Max 8-hr | 1st Max 1-hr | Annual Mean | 2nd Max 1-hr | 2nd Max 3-hr | 2nd Max 24-hr | Annual Mean | 2nd Max 24-hr | Annual Mean | Days Over Std. | 98th Percentile 24-hr | Annual Mean |
| 2004 | 0.097 | 0.077 | 5 | 5.5 | 4.7 | 0.048 | 0.005 | 0.010 | 0.008 | 0.007 | 0.002 | 85 | 19 | 0 | 7.9 | 3.96 |
| 2005 | 0.114 | 0.078 | 13 | 5.1 | 4.5 | 0.043 | 0.006 | 0.011 | 0.009 | 0.008 | 0.006 | 72 | 19 | 0 | 10.2 | 4.05 |
| 2006 | 0.097 | 0.079 | 16 | 5.2 | 4.2 | 0.040 | 0.005 | 0.011 | 0.008 | 0.007 | 0.002 | 97 | 18 | 0 | 9.8 | 3.87 |
| 2007 | 0.092 | 0.081 | 7 | 4.2 | 3.7 | 0.047 | 0.006 | 0.006 | 0.006 | 0.003 | 0.001 | 96 | 22 | 0 | 8.9 | 3.77 |
| 2008 | 0.084 | 0.071 | 1 | 4.7 | 3.7 | 0.049[c] | 0.008[c] | 0.005 | 0.002 | 0.001 | 0.001 | 96 | 21 | 1 | 22.5[d] | 9.07[d] |

Notes:

a. Data from Monitor Site ID 320030022 (Site Address: NE of City – 12101 Hwy 93/I15, North Las Vegas, Clark County, Nevada).
b. Data from Monitor Site ID 320030539 (Site Address: 4001 East Sahara Avenue, Las Vegas, Clark County, Nevada).
c. Data from Monitor Site ID 320030075 (Site Address: 6651 W. Azure Ave., Las Vegas, Clark County, Nevada).
d. Data from Monitor Site ID 320030561 (Site Address: 2501 Sunrise Ave., Las Vegas, Clark County, Nevada).
e. No exceedances of the air quality standard during the 5-year period.

### 3.6.1.3. Existing Sources of Air Pollutants

Air quality in a given area is affected by multiple sectors and activities. Those sectors include industrial, mobile sources, agricultural, commercial, and urbanized activities. The proposed site is essentially an area that is not impacted by these sectors directly, but is affected indirectly through transportation of air pollutants through meteorological conditions. The influences from these sectors are typically measured by the state through the ambient air quality monitoring program. In general, the impacts from these types of sources are called "area sources."

Two significant area sources that can cause local air quality concerns are windblown fugitive dust and mobile impacts from on-road and non-road vehicles. Windblown fugitive dust is a widespread issue in the arid and semi-arid regions of Clark County. Following disturbance by construction, industrial, agricultural, and/or recreational activities, desert lands are subject to wind-driven emissions of fugitive dust. Soil-derived particles can obstruct visibility, cause property damage, and/or contribute to violations of air quality standards for fine particles.

Non-road mobile sources are a subset of the area source category. They include recreational boats, locomotives, and a broad category of off-highway equipment that covers everything from large earth-moving and construction equipment to lawn mowers. On-road mobile sources consist of automobiles, trucks, motorcycles, and other motor vehicles traveling on roadways.

As stated above, the proposed site location is influenced by existing sources of air pollutants, primarily in the form of fugitive dust and mobile sources associated with I-15 and the adjacent Travel Center. Also noted is the Reed Gardner coal fired plant fly ash / fossil fuel combustion pollutants and emissions. This fossil fuel electric generation plant is located near the southeast corner and bordering the Reservation.

## 3.7. Noise

Noise pollution is generally defined as unwanted or objectionable sound. The effects of excess noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment. An assessment of the potential for a project to result in adverse noise effects requires an evaluation of several factors. These factors include: an inspection of the site's general setting (such as isolated, rural, suburban, or urban); nature of the existing ambient noise sources or activities occurring in those settings; proximity of the receptor to the existing ambient noise source or activity; time of day; and various sound attenuating factors such as vegetation, ground absorption, topographic features, intervening structures, and atmospheric conditions.

Sound is a physical disturbance in a medium, such as air, that is capable of being detected by the human ear. Sound waves in air are caused by variations in pressure above and below the static value of atmospheric pressure. Sound is measured in units of decibels (dB) on a logarithmic scale. The "pitch" (high or low) of the sound is a description of frequency, which is measured in Hertz (Hz). Most common environmental sounds are composed of a composite of frequencies. A normal human ear can usually detect sounds within frequencies from 20 Hz to about 20,000 Hz. However, humans are most sensitive to frequencies from 500 Hz to 4000Hz.

Certain frequencies are given more "weight" during assessment because human hearing is not equally sensitive to all frequencies of sound. This is accomplished by applying an "A-weighted" correction factor. This correction factor is widely applied in the industry and is known to de-emphasize the very low and very high frequencies of sound in a manner similar to the response of the human ear. A-weighted sound levels correlate well to a human's subjective reaction to noise

The dBA scale corresponds to the sensitivity range of human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of 3 dBA is barely noticeable to people in a community. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA change in noise level is perceived as a doubling or halving of noise loudness, while a 20-dBA change is considered a dramatic change in loudness. Table 3-8 provides typical instantaneous noise levels of common activities in dBA.

**Table 3-8.**

**Typical Noise Levels**

| Common Outdoor Activities | Noise Level (dBA) | Common Indoor Activities |
|---|---|---|
| | 110 | Rock band |
| Jet Fly-over at 1,000 feet | 100 | |
| Gas Lawn Mower at 3 feet | 90 | |
| Diesel Truck at 50 feet, at 50 miles per hour (mph) | 80 | Food blender at 3 feet<br>Garbage disposal at 3 feet |
| Noisy Urban Area, Daytime Gas Lawn Mower at 100 feet | 70 | Vacuum cleaner at 10 feet |
| Commercial Area<br>Heavy Traffic at 300 feet | 60 | Normal speech at 3 feet |
| Quiet Urban Daytime | 50 | Large business office<br>Dishwasher in next room |

**Table 3-8 Continued**

| Common Outdoor Activities | Noise Level (dBA) | Common Indoor Activities |
|---|---|---|
| Quiet Urban Nighttime | 40 | Theater<br>Large conference room (background) |
| Quiet Suburban Nighttime | 30 | Library |
| Quiet Rural Nighttime | 20 | Bedroom at night<br>Concert hall (background) |
|  | 10 | Broadcast/recording studio |
| Lowest Threshold of Human Hearing | 0 | Lowest threshold of human hearing |

Source: Caltrans Technical Noise Supplement, October 1998

An individual's sound exposure is based on a measurement of the noise that the individual experiences over a specified time interval. A sound level is a measurement of noise that occurs during a specified period of time. A continuous source of noise is rare for long periods of time and is typically not a characteristic of community noise. Community noise refers to outdoor noise in the vicinity of a community and most commonly originates from transportation vehicles or stationary mechanical equipment. A community noise environment varies continuously over time with respect to the contributing sources. Within a community, ambient noise levels gradually change throughout a typical day and the changes can be correlated to the increase and decrease of transportation noise or to the daytime/nighttime operation of stationary mechanical equipment. The variation in community noise throughout a day is also due to the addition of short-duration, single-event noise sources, such as aircraft and sirens, as well as various natural sources.

The metrics for evaluating the community noise environment are based on measurements of the noise exposure over a period of time in order to characterize and evaluate the cumulative noise impacts. These metrics are time varying and are defined as statistical noise descriptors. The most common metrics for evaluating community noise are as follows:

**Leq:** The equivalent sound level, or the time-integrated continuous sound level, that represents the same sound energy as the varying sound levels, logarithmically averaged over a specified monitoring period.

**Lmax:** The instantaneous greatest noise level measured on a sound level meter during a designated time interval.

**Lmin:** The instantaneous lowest noise level measured on a sound level meter during a designated time interval.

**Lx:** The base sound level that is exceeded x percent during a specified time.

**DNL:** The Day-Night Average Sound Level (abbreviated as DNL or LDN) that represents a 24 hour, A-weighted sound level average from midnight to midnight, where sound levels during the nighttime hours of 10:00 PM to 7:00 AM have an added 10 dB weighting, but no added weighting on the evening hours (7:00 PM to 10:00PM).

**CNEL:** The Community Noise Equivalent Level that represents a 24-hour A-weighted sound level average conducted from midnight to midnight, where sound levels during the evening hours of 7:00 PM to 10:00 PM have an added 5 dB weighting, and nighttime hours of 10:00 PM to 7:00 AM have an added 10 dB weighting.

### 3.7.1. Existing Noise Conditions

The Proposed Project is located within a rural area. The existing ambient noise environment in the vicinity of the Proposed Project comprises mainly natural sounds, vehicle noise associated with I-15, railway noise associated with the Union Pacific Railroad, and over flight aircraft operations. The Travel Plaza is located approximately 0.75 miles south of the Proposed Project across I-15. This plaza uses diesel generators for power and is also shown to be a significant service and recreational stop for trucks and passenger vehicles travelling along I-15. There are no other identified noise sources located within the vicinity of the Proposed Project.

The nearest residential receptor is located approximately 10 miles northeast of the Proposed Project in Moapa Town. There are no other identified human sensitive receptors located within the vicinity of the Proposed Project. Wildlife sensitive receptors would potentially be located on-site or adjacent to the fenced solar facility area and along proposed access and construction corridors. Noise Sensitive Locations, here defined as sensitive receptors are defined as any dwelling house, hotel or hostel, health building, educational establishment, place of worship, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels (EPA 2006).

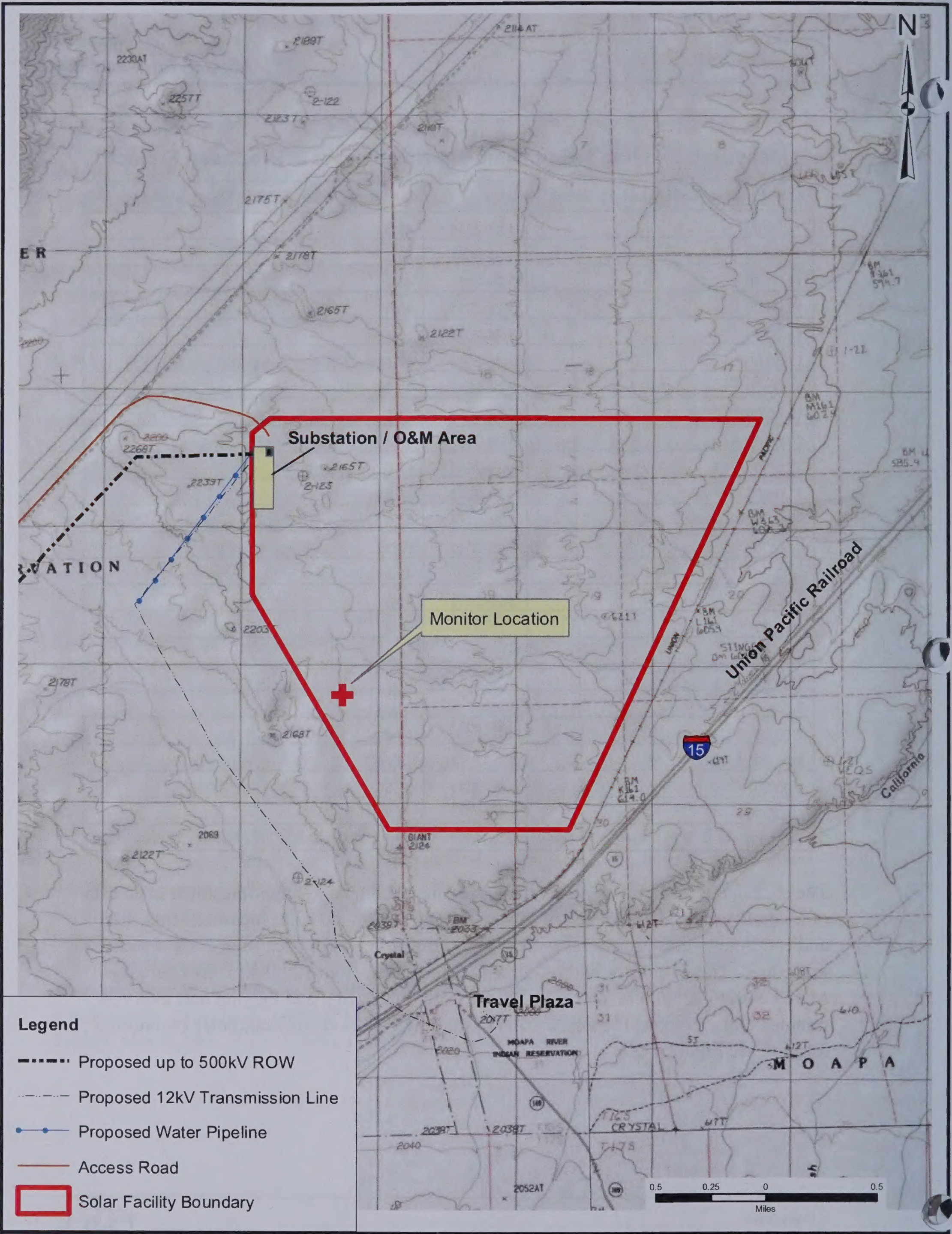
To confirm and document the current ambient baseline noise conditions at the site, a single environmental noise monitor was placed within the proposed solar facility boundary to capture the rise and fall of ambient noise conditions in the area. The noise meter was located at the southwestern portion of the proposed solar facility and was subsequently programmed to record the appropriate data acquisition format for use in describing the significant daily background noise levels prevalent within the area of the Proposed Project. The single 24-hour noise monitor was programmed to record continuously throughout a typical business day from Thursday, March 24th, 2011 to Friday, March 25th, 2011. The noise monitor results are summarized in Table 3-9 below.

## Table 3-9.
## Measured Existing 1-Hour Ambient Noise Level at Proposed Project

| Monitor Start Time (Military Time) | Date | Measured 1-hour Noise Level (dBA Leq) |
|---|---|---|
| 12:00:00 | 3-24-2011 | 45.6 |
| 13:00:00 | 3-24-2011 | 43.3 |
| 14:00:00 | 3-24-2011 | 41.6 |
| 15:00:00 | 3-24-2011 | 45.1 |
| 16:00:00 | 3-24-2011 | 53.4 |
| 17:00:00 | 3-24-2011 | 47.4 |
| 18:00:00 | 3-24-2011 | 49.0 |
| 19:00:00 | 3-24-2011 | 41.9 |
| 20:00:00 | 3-24-2011 | 44.8 |
| 21:00:00 | 3-24-2011 | 57.7 |
| 22:00:00 | 3-24-2011 | 57.2 |
| 23:00:00 | 3-24-2011 | 44.3 |
| 0:00:00 | 3-25-2011 | 50.3 |
| 1:00:00 | 3-25-2011 | 43.3 |
| 2:00:00 | 3-25-2011 | 47.3 |
| 3:00:00 | 3-25-2011 | 52.6 |
| 4:00:00 | 3-25-2011 | 39.8 |
| 5:00:00 | 3-25-2011 | 37.0 |
| 6:00:00 | 3-25-2011 | 39.8 |
| 7:00:00 | 3-25-2011 | 44.0 |
| 8:00:00 | 3-25-2011 | 45.2 |
| 9:00:00 | 3-25-2011 | 51.5 |
| 10:00:00 | 3-25-2011 | 55.9 |
| 11:00:00 | 3-25-2011 | 45.8 |

Source: ARCADIS

The continuous 24-hour sound level measurement (Ldn, A-weighted) resulted in an Ldn of 54.4 dBA and a 24 hour Leq of 50.4 dBA. During on-site noise measurements, start and end times were recorded as well as any significant and/or background noise sources in the area. The 24-hour sound level measurements ran from 12:00 p.m. on Thursday March 24th to 12:00 p.m. on Friday March 25th, integrating and logging data every 30 minutes. For a graphical representation of the single 24-hour ambient noise monitoring location see Figure 3-9.


N
Substation / O&M Area
Monitor Location
Union Pacific Railroad
Travel Plaza
15
MOAPA RIVER INDIAN RESERVATION
M O A P A
CRYSTAL
Crystal
California
R V A T I O N
E R
Legend
Proposed up to 500kV ROW
Proposed 12kV Transmission Line
Proposed Water Pipeline
Access Road
Solar Facility Boundary
0.5
0.25
0
0.5
Miles

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Noise Monitor Location

MALCOLM PIRNIE, INC.

March 2011

FIGURE 3-9

Sound level meters are field-calibrated prior to and following the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report are in accordance with and were made using a sound level meter that conforms to the American National Standards Institute (ANSI SI.4-1983 - R2001) specifications for sound level meters. All instruments are maintained with National Bureau of Standards traceable calibrations.

Results of any investigations or field measurements and any findings presented in this report apply solely to conditions existing at the time when the investigative work was performed. It must be recognized that any such investigative or measuring activities are inherently limited and do not represent a conclusive or complete characterization of the Proposed Project. Conditions in other parts of the Proposed Project may vary from those at the locations where ambient noise data were collected. The ability to interpret investigation results is related to the availability of the data and the extent of the investigation activities.

#### 3.7.1.1. Regulatory Framework

There are no federal, state, or local laws or regulations directly regulating offsite (community) noise impact receptors on tribal lands. A majority of the electrical transmission line will extend into the BLM managed utility corridor. The BLM does not have jurisdiction or noise regulations or standards; however, the Tribe's Law and Order Code makes it a crime for a person to maintain a public nuisance, including the interference with the enjoyment of property by willfully or negligently permitting hazardous, unsightly or unhealthy conditions to exist on property under his possession or control.

The Environmental Protection Agency (USEPA 1974) has developed and published criteria for environmental noise levels with a directive to protect public health and welfare with an adequate margin of safety. The EPA criteria (Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety) were developed to be used as an acceptable guideline when no other local, county, or state standard has been established. However, the EPA criteria are not meant to substitute for agency regulations or standards in place by states or localities.

The EPA established its criteria using the day-night average sound exposure (Ldn) metric. This metric is a 24-hour average noise level calculated by obtaining the daytime noise level from the hours of 7:00 a.m. to 10:00 p.m. and applies a 10 dB penalty for the more restrictive and quieter nighttime noise levels between the hours of midnight and 7:00 a.m. and 10:00 p.m. to midnight.

According to the EPA guidelines, an Ldn of 45 dBA indoors and 55 dBA outdoors for residential areas in a rural setting is identified as the maximum allowable noise level for which no effects on public health and welfare occur due to interference with speech or other activities. These levels would also protect the vast majority of the population under most conditions against annoyance, in the absence of intrusive noises with particularly aversive content. Table 3-10 was published by the EPA and summarizes the maximum allowable noise level for specified areas.

**Table 3-10.**
**Summary of Noise Levels Identified as Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety**

| Effect | Level | Area |
|---|---|---|
| Hearing loss | Leq(24) =< 70 dB | All areas |
| Outdoor activity interference and annoyance | Ldn =< 55 dB | Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use |
| | Leq(24) =< 55 dB | Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc. |
| Indoor activity interference and annoyance | Ldn =< 45 dB | Indoor residential areas |
| | Leq(24) =< 45 dB | Other indoor areas with human activities such as schools, etc. |

Source: USEPA, 1974

The Proposed Project will also be governed by Federal OSHA hearing conservation noise exposure regulations. These regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which a worker is exposed. The Federal OSHA Occupational Noise Exposure standard states:

### OSHA CFR 1910.95(b)(1)

When employees are subjected to sound exceeding those listed in Table 3-11, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table 3-11, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

### OSHA CFR 1910.95(b)(2)

If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

### Table 3-11.
### Permissible Noise Exposures

| Duration per day, hours | Sound level dBA slow response (1) |
|---|---|
| 8 | 90 |
| 6 | 92 |
| 4 | 95 |
| 3 | 97 |
| 2 | 100 |
| 1 ½ | 102 |
| 1 | 105 |
| ½ | 110 |
| ¼ or less | 115 |

Source: OSHA, 2007 -29CFR Subpart H – Section 1910.95

Footnote(1) When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: C(1)/T(1) + C(2)/T(2) C(n)/T(n) exceeds unity, then the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

## 3.8. Biological Resources

Information on biological resources for the Proposed Project was gathered through desktop assessment, literature review and field surveys. Field surveys for desert tortoise and sensitive vegetation (Las Vegas buckwheat) were conducted by ARCADIS biological scientists in October 2010. Desktop analyses were conducted by reviewing current regional literature and accessing agency Internet biological databases and resources: Nevada Department of Wildlife (NDOW) Diversity GIS Data, National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS) topographic maps, Nevada Natural Heritage Program (NNHP) database, and aerial imagery as well as review of existing reports and studies that were conducted for similar projects at or near the Proposed Project.

### 3.8.1. Vegetation

There are approximately 200 endemic plant species found in the Mojave Desert. These plants are typically tolerant of low humidity, prolonged droughts, desiccating winds, high alkalinity or salinity, rocky or very sandy soils, and the periodic influx of high quantities of water in the form of surface flooding (NDOW 2006). Hot deserts, such as the Mojave Desert in southwestern North America, are predicted to be among the most sensitive ecosystems to rising atmospheric carbon dioxide ($CO_2$) concentration (Strain & Bazzaz 1983) (Yoder et al 2000).

The most commonly found species is the creosote bush (*Larrea tridentata*). Approximately 70 percent of the Mojave Desert is covered by creosotebush-white bursage (*Ambrosia dumosa*) associations. Species associated with creosotebush-white bursage communities in the Mojave Desert include Shockley's goldenhead (*Acamptopappus shockleyi*), Anderson's wolfberry (*Lycium andersonii*), range rhatany (*Krameria parvifolia*), Mojave yucca (*Yucca schidigera*), California joint fir (*Ephedra funerea*), spiny hopsage (*Grayia spinosa*), and winterfat (*Krascheninnikovia lanata*) (Feller 2010). Other associated species are desertsenna (*Cassia armata*), Nevada ephedra *(Ephedra nevadensis)*, white burrobrush *(Hymenoclea salsola)* and wolfberry (USDAFS 2010). Grasses regularly found are big galleta (*Hilaria rigida*), Indian rice grass (*Oryzopsis hymenoides*), bush muhly (*Muhlenbergia porteri*), fluff grass (*Erioneuron pulchellum*), red brome (*Bromus rubens*), desert needle (*Stipa speciosa*), Arabian grass (*Schismus arabicus*), snakeweed (*Gutierrezia*), desert trumpet (*Eriogonum inflatum*), winged saltbush (*Atriplex canescens*), and desert grass (*Blepharidachne kingii).*

The general ecological setting of the Proposed Project is consistent with Mojave Desert scrub. The area is dominated by open stands of creosotebush and white bursage. Desert saltbush scrub habitat and cactus-yucca scrub are also present and concentrated within the ephemeral washes. Cacti species observed during the biological surveys were the barrel cactus (*Ferocactus acanthodes*), beavertail cactus (*Opuntia basilaris*), cottontop cactus (*Echinocactus polycephalus*), hedgehog cactus (*Echinocereus engelmanii var. chrysocentrus.*), pencil cholla (*Opuntia ramosissima*), silver cholla (*Opuntia echinocarpa*) and teddybear cholla (*Opuntia bigelovii*). Arabian grass, snakeweed (*Gutierrezia sp.*), desert trumpet, desertgrass ,catclaw (*Acacia greggii )*and winged saltbush were also identified.

A species list of plants observed in the Proposed Project area is presented in Table 3-12.

**Table 3-12.**
**Vegetation Observed at the Proposed Project**

| Common Name | Scientific Name |
|---|---|
| **Cacti** | |
| beavertail cactus | *Opuntia basilaris* |
| barrel cactus | *Ferocactus acanthodes* |
| cottontop cactus | *Echinocactus polycephalus* |
| golden cholla | *Cylindropuntia echinocarpa* |
| hedgehog cactus | *Echinocereus engelmannii* |
| Mojave yucca | *Yucca schidigera* |
| pencil cholla | *Opuntia ramosissima* |
| silver cholla | *Opuntia echinocarpa* |
| teddybear cholla | *Opuntia bigelovii* |

**Table 3-12 Continued**

| Common Name | Scientific Name |
|---|---|
| **Grasses** | |
| Arabian grass | *Schismus arabicus* |
| big galleta | *Hilaria rigida* |
| bush muhly | *Muhlenbergia porterii* |
| desert grass | *Blepharidachne kingii* |
| desert needle | *Stipa speciosa* |
| fluffgrass | *Erioneuron pulchellum* |
| Indian rice-grass | *Oryzopsis hymenoides* |
| Mediterranean grass | *Schismus sp.* |
| red brome | *Bromus rubens* |
| **Herbaceous** | |
| Arizona honeysweet | *Tidestromia oblongifolia* |
| buckwheat | *Eriogonum sp.* |
| creosote bush cryptantha | *Cryptantha angustifolia* |
| desert evening-primrose | *Oenothera deltoids* |
| desert marigold | *Baileya multiradiata* |
| desert primrose | *Camissonia brevipes* |
| desert trumpet | *Eriogonum inflatum* |
| exalted buckwheat | *Eriogonum insigne* |
| fanleaf | *Psathyrotes annua* |
| heliotrope phacelia | *Phacelia crenulata* |
| Mallow | *Sphaeralcea sp.* |
| Palmer phacelia | *Phacelia palmeri* |
| plantain | *Plantago sp.* |
| Russian thistle | *Salsola tragus* |
| spiny herb | *Chorizanthe rigida* |
| spurge | *Chamaesyce sp.* |
| wire-lettuce | *Stephanomeria pauciflora* |
| gilia | *Gilia sp.* |
| snakeweed | *Gutierrezia sp.* |
| spiny hopsage | *Grayia spinosa* |

Table 3-12 Continued

| Common Name | Scientific Name |
|---|---|
| **Shrubs** | |
| bladder sage | *Salazaria mexicana* |
| cat-claw acacia | *Acacia greggii* |
| creosote bush | *Larrea tridentata* |
| desert peppergrass | *Lepidium fremontii* |
| desert saltbush | *Atriplex polycarpa* |
| desert thorn | *Lycium sp.* |
| desert willow | *Chilopsis linearis* |
| desertsenna | *Cassia armata* |
| fourwing saltbush | *Atriplex canescens* |
| Fremont indigobush | *Psorothamnus fremontii* |
| littleleaf ratany | *Krameria erecta* |
| matchweed | *Gutierrezia microcephala* |
| Mojave seablite | *Suaeda nigra* |
| Mojave yucca | *Yucca schidigera* |
| Nevada ephedra | *Ephedra nevadensis* |
| punctate rabbitbrush | *Chrysothamnus paniculatus* |
| shadscale | *Atriplex confertifolia* |
| Shockley's goldenhead | *Acamptopappus shockleyi* |
| white burrobrush | *Hymenoclea salsola* |
| white bursage | *Ambrosia dumosa* |
| whitestem paperflower | *Psilostrophe cooperi* |
| wooly bursage | *Ambrosia eriocentra* |

### Mojave Yucca

Mojave yucca *(Yucca schidigera)* is a common inhabitant of the creosote desert flats. This plant provides browse for a number of wildlife species during spring, summer, and fall (Feller, no date). The flowerstalks and foliage of Mojave yucca are palatable to cottontail rabbits, black-tailed jackrabbits, and some wild ungulates during much of the year (Feller, no date). The yucca provides shelter and shade for many mammals, birds and reptiles. Furthermore, there is an obligate, mutualistic relationship between the Mojave yucca and the small white Yucca moth *(Tegeticula yuccasella)*. The Mojave yucca relies solely on the moth for pollination and the moth's larvae rely solely on the yucca seeds as a primary food source. The Mojave yucca is protected and regulated by the state of Nevada (Table 3-13) under Nevada Revised Statute (NRS) and Nevada Administrative Code chapter 527 for sale of and transport. During the biological surveys, 521 yucca were recorded on-site.

### Table 3-13.
### State Protected and Regulated Cacti under NRS 527.061/.063

| Scientific Name | Common Name | Protection Status |
|---|---|---|
| *Opuntia bigelovii* | Teddybear cholla | CY |
| *Opuntia echinocarpa* | Silver cholla, golden cholla | CY |
| *Echinocactus polycephalus* | Cottontop cactus | CY |
| *Echinocereus engelmannii var. chrysocentrus* | Hedgehog cactus | CY |
| *Ferocactus cylindraceus* | Barrel cactus | CY |
| *Opuntia basilaris* | Beavertail cactus | CY |
| *Opuntia ramosissima* | Pencil cactus, pencil cholla | CY |
| *Yucca schidigera* | Mojave yucca | CY |

Source: Nevada Natural Heritage 2009.
CY = Protected as a Cactus, Yucca, or Christmas tree

**Cacti Species**
Cacti are another type of vegetation common to the Proposed Project site. These succulents thrive in coarse, well-drained soils, in areas varying from rocky outcrops and dry rocky flats or slopes to gravely soils in grasslands. Birds, such as cactus wrens, thrashers and verdins, nest in cacti and thorny scrub. The nectar and pollen produced by the flowers of cacti provide a nutritious food source for birds, bats and insects. The fruits and seeds of cacti are readily consumed by a variety of wildlife. Beavertail, hedgehog, cottontop, and barrel cacti were common species observed. Of the cholla cacti, silver, teddybear and pencil species were surveyed. The cacti listed in Table 3-13 are protected and regulated by the state of Nevada (Table 3-13) under NRS and Nevada Administrative Code chapter 527 for sale of and transport.

Currently, The Tribal Ordinance does not dictate how state protected species status will be applied or dealt with on tribal lands.

#### 3.8.1.1. Riparian

The site contained five ephemeral desert washes that did not display any variation in vegetation from the adjacent areas; therefore no riparian areas exist within the Proposed Project site.

#### 3.8.1.2. Listed Federal Threatened or Endangered Species in Clark County

**Las Vegas Buckwheat**
In April 2008, the Center for Biological Diversity petitioned the U.S. Fish and Wildlife Service to protect the Las Vegas buckwheat *(Eriogonum corymbosum nilesii)* under the federal Endangered Species Act (ESA). The Las Vegas buckwheat was listed as a candidate on December 10, 2008.

Las Vegas buckwheat is native to Las Vegas and is found in Clark and Lincoln counties. Soils with high gypsum levels are preferred and only 859 acres of habitat remain that are not yet slated for development (Center for Biological Diversity 2010).

Human population growth and urban development in Las Vegas has resulted in the loss of over 95 percent of the potential historical habitat in the Las Vegas Valley (USFWS 2010). Loss of habitat is also from unmanaged off-road vehicle recreation, gypsum mining, and energy corridors. The Las Vegas buckwheat was not identified on site during biological surveys.

**Blue Diamond Cholla**

The blue diamond cholla *(Cylindropuntia multigeniculata)* is on the Nevada state list of fully protected species of native flora (NAC 527.010), also known as the Critically Endangered Species List (Nevada Natural Heritage Program 2009). No member of its kind may be removed or destroyed at any time by any means except under special permit issued by the state forester firewarden (N.R.S. 527.270) (Nevada Natural Heritage Program 2009).

The typical form of the species is endemic to Clark County, Nevada (Baker 2005). Blue diamond cholla occurs in a variety of locations and soil types. Sandy loam, gravel, coarse cobbled soils, silty alluvial fan terraces, decomposed granite and schist, and clays of volcanic origin (Baker 2005) are types of soils tolerated by this species. Blue diamond cholla prefers steep, dry rocky slopes with minimal vegetative competition (Baker 2005) but also grows in floodplains and within dry rocky washes.

Human population growth and urban development, road construction, and mining are the main factors contributing to the status of the cholla. Although the population is considered stable, there have not been any formal studies conducted on population growth or decline over time.

During biological surveys it was determined that the blue diamond cholla is not present at the Proposed Project site nor does suitable habitat exists within the Proposed Project.

## 3.8.2. Wildlife

### 3.8.2.1. Terrestrial

The Mojave Desert is principal habitat for heat-tolerant organisms with specialized adaptations for thriving in a seeming inhospitable environment. General listings of species inhabiting the Proposed Project site and observed during the biological surveys were the desert tortoise, several species of birds, hares, and a variety of lizards. Commonly observed bird species include Gambel's Quail (*Callipepla gambelii*), Turkey Vulture (*Cathartes aura*), Mourning Dove (*Zenaida macroura*), Greater Roadrunner

(*Geococcyx californianus*), and Common Raven (*Corvus corax*). Small mammal residents include deer mice (*Peromyscus maniculatus*), kangaroo rats (*Dipodomys spp.*), pocket mice (*Perognathus spp.*), pack rats (*Neotoma spp.*), ground squirrels, and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Common larger mammals include coyotes (*Canis latrans*), kit foxes (*Vulpes macrotis*), gray foxes (*Urocyon cinereoargenteus*), badgers (*Taxidea taxus*), desert cottontails (*Sylvilagus audubonii*), and black-tailed jackrabbits (*Lepus californicus*). Reptiles included western whiptail lizard (*Cnemidophorus tigris*), side-blotched lizard (*Uta stansburiana*), collared lizard (*Crotaphytus collaris*), horned lizard (*Phrynosoma* sp.), zebra-tailed lizard (*Callisaurus draconoides rhodostictus*), long-nosed leopard lizard (*Gambelia wislizenii*), and desert tortoise (*Gopherus agassizii*).

#### Bats

No bats are currently listed by the USFWS or the Nevada Natural Heritage Program as threatened or endangered in Clark County, Nevada (USFWS 2010, Nevada Natural Heritage 2009). The BLM has listed four species of bat as sensitive species. BLM policy is to provide these species with the same level of protection as is provided for candidate species in BLM Manual 6840.06 C, that is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed." The sensitive species designation is normally used for species that occur on Bureau-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. The four protected bat species: California-leafed nose bat (*Macrotus californicus*), California myotis (*Myotis californicus)*, Townsend's big eared bat (*Plecotus townsendii*), and big free-tailed bat (*Nyctinomops macrotis*), are only expected to be present within the Proposed Project during nocturnal foraging events.

#### Wild Burro

The nearest Herd Management Area (HMA) is approximately 20 miles southeast of the Proposed Project. The Muddy Mountain Herd Management Area is located in southern Nevada, approximately 40 miles east of Las Vegas in Clark County. The BLM, Las Vegas District, and U.S. Park Service have joint administrative responsibilities for wild burro management within these public lands. The HMA consists of a total of 140,699 acres, with 61,226 acres managed by the BLM and 79,473 acres managed by the NPS.

### 3.8.2.2. Aquatic

No aquatic features are present on the Proposed Project site.

### 3.8.2.3. Listed Federal Threatened or Endangered Species in Clark County

#### Desert Tortoise

The desert tortoise is a large, herbivorous (plant-eating) reptile that occurs in the Mojave (*Gopherus agassizii*) and Sonoran (*G. morafkai*) deserts in southern California, southern Nevada, Arizona, and the southwestern tip of Utah in the U.S., as well as Sonora and northern Sinaloa in Mexico. The designated Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California (USFWS 2011).

The Mojave population has been divided into six distinct population segments or recovery units, each designated as an evolutionarily significant unit (ESU). Each ESU was delineated based on variations in genetic, morphological, ecological, physiological, and behavioral traits (USFWS 1994). Some of the six recovery units were further subdivided into Desert Wildlife Management Areas (DWMAs). A total of 6.4 million acres of Critical Habitat was designated in 1994 (59 FR 5820-5866). Within those six management units, DWMAs were identified where populations of tortoises facing similar threats would be managed with the same strategies (59 FR 5820-5866).

Among the most important recovery actions implemented pursuant to the 1994 Recovery Plan has been formalizing DWMAs through Federal land-use planning processes. Particularly on BLM lands, DWMAs are administered and designated as Areas of Critical Environmental Concern (ACEC). These ACECs define specific management areas based on the general recommendations for DWMAs in the 1994 Recovery Plan. Boundaries of the ACECs were refined slightly from the critical habitat designation based on various management and biological considerations. The BLM's DWMAs/ACECs, together with National Park Service lands, designated wilderness areas, other lands allocated for resource conservation, as well as restricted-access military lands, provide an extensive network of habitats that are managed either directly or indirectly (e.g., wilderness areas outside desert tortoise ACECs) for desert tortoise conservation (USFWS 2011).

The desert tortoise is protected by the State of Nevada. The Mojave population is a covered species under Clark County's Multiple Species Habitat Conservation Plan and it is considered sensitive by the BLM and USFS.

The Proposed Project is contained within the boundary of the Reservation near the middle of the north end of the Dry Lake Valley west of I-15. The nearest DWMA (Mormon Mesa) to the Proposed Project is on the west slope of the Arrow Canyon Range, over 10 miles west of the Proposed Project.

Adequate shelter is a critical habitat component for the Mojave desert tortoise. Like the Sonoran population, the Mojave population will use burrows to avoid extreme hot or cold temperatures. Mojave desert tortoises are more likely to excavate burrows under vegetation than in rocky areas, and their burrows can be up to 10 meters (33 feet) in length (AGFD 2001). The use of burrows by the Mojave desert tortoise aids in body temperature regulation through higher humidity and the resultant evaporative cooling effects within the burrow (Lawler, no date).

The annual cycle of the Mojave population tortoises begins in February or March when they emerge from hibernation (AGFD 2001). Mating generally takes place in the spring, and 2 to 14 eggs are laid in an excavated nest near a shrub or burrow entrance between May and July (Lawler, no date). Young tortoises emerge from the eggs after incubating for 70 to 135 days (Lawler, no date). Hatchling and juvenile mortalities are very high; it has been estimated that only one hatchling for every 15 to 20 nests will survive to reach sexual maturity (Lawler, no date). Average age of sexual maturity of females is primarily a function of animal size, but is usually between 12 and 25 years (USFWS 1994). Members of the Mojave population produce one to three clutches of eggs per year, but the total number of eggs laid may be similar to the single larger clutch produced by Sonoran population tortoises (Turner et.al. 1984).

Desert tortoises are primarily herbivores, consuming a wide variety of plant materials including dicot annuals, grasses, herbaceous perennials, trees, shrubs, subshrubs/woody vines, and succulents (AGFD 2001). A study of their food habits in the Mojave Desert found that they used 43 plant species, including 37 annuals and 6 perennials (Jennings 1997). Some of the preferred plants were dwarf white milkvetch (*Astragalus didymocarpus*), widow's milkvetch (*A. zayneue*), Booth evening primrose (*Camissonia boothii*), rattlesnake weed (*Camissonia* [Euphorbia] *albomarginata*), foothill deervetch (*Lotus humistratus*), Bigelow four o'clock (*Mirabilis bigelovii*), and brightwhite (*Prenanthella exigua*). Desert tortoise diet in this study showed a very strong preference for native plants (95.3 percent), and some of their preferred food plants were uncommon to rare (Jennings 1997).

A study on juvenile tortoises (Spangenberg 1995) found a preference for non-native, invasive plant species such as Mediterranean grass (*Schismus barbatus*) and filaree (*Erodium cicutarium*). These two species comprised 64 percent of juvenile tortoise diet. This study also revealed a difference in diet between wet and dry summers. During a very dry summer, tortoises were observed foraging on only three species while they used 15 species during a wet summer (Spangenberg 1995). Tortoises may forage selectively, sampling several possibilities before consumption (Lawler, no date). Selective food preferences of individual tortoises within a population make plant species diversity an important constituent of preferred tortoise habitat (Tracy 2001). They will also ingest rocks, bones, and soil, possibly to maintain intestinal bacteria, to provide additional minerals, or as gastroliths to aid digestion (Ivanyi et al. 2000; Lawler, no date).

The Mojave population of desert tortoise occurs primarily on flats and bajadas with soils ranging from sand to sandy-gravel, characterized by scattered shrubs and abundant inter-space for growth of herbaceous plants. They occur in creosote bush, alkali sink, and tree yucca habitats in valleys, on alluvial fans, and in low rolling hills at elevations ranging from sea level to 5,000 feet. They appear to prefer bajadas and desert washes where soils range from sandy-loam to light gravel-clay, which is optimal for burrow construction. Shelter sites often occur on lower bajadas and basins in burrows dug in soil, cavities in sides of washes, and depressions under shrubs.

Suitable habitat and species occurrence have been documented at the Proposed Project site.

### Relict Leopard Frog

In May 2002, the USFWS was petitioned to list the relict leopard frog (*Lithobates onca*) as an endangered species under the ESA (Center for Biological Diversity and Southern Utah Wilderness Alliance 2002) and was listed as a Federal candidate species. The petition was based largely on the restricted distribution of the known populations and low numbers of individuals of the species.

Leopard frogs generally require shallow water with emergent vegetation for foraging and basking, and deeper water, root masses, undercut banks, and debris piles for cover and hibernacula. Relict leopard frogs are currently known to occur only in seven natural and eight translocated sites within two general areas in Nevada, one near the Overton Arm area of Lake Mead, and the other near Black Canyon below Lake Mead (Bradford *et al.* 2004), approximately 24 miles southeast of the Proposed Project.

The causes for population declines of this species are not entirely clear, but suggested factors include alteration of aquatic habitat due to agriculture and water development, and the introduction of exotic predators and competitors (Jennings 1988).

The relict leopard frog does not occur, nor is suitable habitat for this species present, in the Proposed Project site.

### Yuma Clapper Rail

The Yuma Clapper Rail (*Rallus longirostris yumanensis*) was listed as an endangered species on March 11, 1967, pursuant to the Endangered Species Preservation Act of 1966 (32 FR 4001). The recovery plan was finalized in 1983 and portions of the action plan were initiated over the ensuing years.

The Yuma Clapper Rail is one of the smaller subspecies of clapper rail, with adult males standing eight inches tall and weighing 266.8 grams on average (Todd 1986). Females are slightly smaller. The present range of the Yuma clapper rail in the U.S. includes portions of Arizona, California, and Nevada. The Yuma Clapper Rail lives in freshwater marshes dominated by cattail (*Typha* spp.) and bulrush (*Scirpus* spp.) with a mix of riparian tree and shrub species (*Salix exigua*, *S. gooddingii*, *Tamarix* spp., *Tessaria serica*, and *Baccharis* spp.) along the shoreline of the marsh (Eddleman 1989).

The principal reason for the decline of the species in the western U.S. has been loss or degradation of riparian habitats from stream channelization and bank protection, grazing, conversion of lands to agriculture, and competition from non-native plant species.

No suitable habitat for this species is located within the Proposed Project site.

### Yellow-billed Cuckoo

The Yellow-billed Cuckoo is a federal candidate for listing as threatened or endangered under the ESA. The Yellow-billed Cuckoo has always been rare in Nevada and while there are still small areas of suitable habitat within the state, the species is apparently extirpated from Nevada (Center for Biological Diversity 1998). Because of recent habitat loss and further decline in numbers, the USFWS has raised the listing priority for the Western Continental U.S. Distinct Population Segment of this species (FR 70: 24875). Yellow-billed Cuckoos may still use remnant habitats present within the state during migration.

Based on historic accounts, the species was widespread and locally common in California and Arizona, locally common in a few river reaches in New Mexico, locally common in Oregon and Washington, and generally local and uncommon in scattered drainages of the arid and semiarid portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah. The scattered cottonwoods on the Colorado River tributaries (Virgin, Muddy, and Pahranagat) are the last places in Nevada where the Yellow-billed Cuckoo can potentially be expected to occur.

The principal reason for the decline of the species in the western U.S. has been loss or degradation of riparian habitats from stream channelization and bank protection, grazing, conversion of lands to agriculture, and competition from non-native plant species, particularly invasion by tamarisk.

No suitable habitat for this species is located within the Proposed Project site.

### Southwestern Willow Flycatcher

The Southwestern Willow Flycatcher (*Empidonax traillii extimus)* was listed by the USFWS as an endangered species within its entire range on February 27, 1995 (FR 60: 10693-10715). Critical habitat for the species was originally designated in 1997 (FR 62: 39129-39147) but subsequently vacated and incidental protection provided along the Virgin River and its 100-year floodplain from the Arizona/Nevada border to Halfway Wash in Nevada (FR 65: 4140-4156).

Critical habitat was again proposed on October 12, 2004 (FR 69: 60706-60736) and redefined and re-instituted in 2005 (FR 70: 60886-61009). Critical habitat for the

Southwestern Willow Flycatcher in Nevada is currently limited to portions of the Virgin River above its confluence with the Muddy River (FR 70: 60886-61 009).

For nesting, flycatchers require dense riparian habitats with microclimatic conditions dictated by the local surroundings. Saturated soils, standing water, or nearby streams, pools, or cienegas are a component of nesting habitat that also influences the microclimate and density of the vegetation component.

Breeding flycatchers have been recorded along the Virgin and Muddy Rivers and at the Pahranagat River and Meadow Valley Wash drainages north of the Proposed Project (USFWS 2002). Potential habitat for this species in the Proposed Project vicinity also occurs along the Colorado River and Las Vegas Wash (PBS&J, 2001).

Loss and degradation of dense riparian habitats are the primary habitat threat to the flycatcher. Historically, water developments that altered flows in the rivers and streams were the primary threat. Now, with riparian areas limited and re-growth difficult due to changes in flows, fire is a significant risk to remaining habitats. Human disturbances at nesting sites may result in nest abandonment.

The Southwestern Willow Flycatcher does not occur, nor is suitable habitat for this species present, in the Proposed Project site.

### Moapa Dace

The Moapa dace (*Moapa coriacea*) occurs in the Muddy River system and is listed as endangered under the ESA. Since the Moapa dace represents a monotypic genus, this species was assigned a recovery priority of 1 (highest ranking) by the USFWS in 1995. The original recovery plan for this species was prepared in 1983 and subsequently revised in 1995. There is currently no critical habitat designated for the Moapa dace.

In 2005, a Memorandum of Agreement (MOA) was developed among the Southern Nevada Water Authority, Moapa Valley Water District, Coyote Springs Investment, LLC, Tribe, and the Service to address groundwater withdrawal from the Coyote Spring Valley and California Wash basins. The Service determined that the MOA is likely to adversely affect the endangered Moapa dace and prepared a programmatic biological opinion (PBO) for adverse effects of groundwater use on the Moapa dace. The MOA provided for future groundwater development up to 16,100 afy, of which 2,500 afy may be withdrawn by the Tribe, from the two basins within the regional carbonate aquifer to the Moapa dace. This total withdrawal and the potential effects to the Moapa dace were evaluated in the PBO. The Moapa dace is not present within the Proposed Project area, however could be indirectly impacted via groundwater withdrawal.

### 3.8.3. State Listed, BLM Special Status Species, and Birds Protected under the MBTA

#### Burrowing Owl

Burrowing Owls (*Athene cunicularia*) inhabit the Mojave Desert portions of Clark County and are protected under the Migratory Bird Treaty Act (MBTA). Burrowing Owls in Southern Nevada are active year-round, do not hibernate, and tend to be year-round residents as opposed to migratory (NDOW 2008). An affable symbol of the desert, the Burrowing Owl, is currently the subject of several biological studies being conducted in Southern Nevada (NDOW 2008).

Burrowing Owls are found in open dry shrub/steppe grasslands, agricultural and range lands, and desert habitats associated with burrowing animals (NDOW 2010a). They consume an assortment of prey items consisting of beetles, grasshoppers, scorpions, small mammals, reptiles, other birds and bats. These owls primarily reside and nest in the abandoned burrows of the desert tortoise, although the burrows of kit foxes and other mammals are used as well. As there is a decline in desert tortoises, the Burrowing Owl may also be affected (NDOW 2008). These owls will also use man-made burrows, as well as pipes or small culverts, often found on construction sites (NDOW 2008).

Burrowing Owl numbers are declining despite protection under the MBTA (USFWS 2007). These owls are not listed as threatened or endangered in Nevada, but biologists are starting to see a range-wide decline due to loss of habitat and collisions with vehicles (NDOW 2008). Loss of habitat from development and construction as well as high mortality rates from collisions with automobiles has caused range-wide decline of this species.

During the October 2010 desert tortoise site survey, three Burrowing Owl burrows were noted on the site. These sites were located along steep cliffs where it is not practical to place solar facility infrastructure; however, loss of foraging habitat may occur. Burrowing owls would be passively relocated to the extent their burrows are impacted.

#### Le Conte's Thrasher

The Le Conte's Thrasher (*Toxostoma lecontei*) is listed as a protected species under the MBTA. The Le Conte's Thrasher is an Evaluation Species under the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and the USFWS has considered listing it as federally threatened or endangered (Audubon 2011). The ideal habitat is one of open desert with scattered shrubs and sandy and/or alkaline soil. Creosote bush (*Larrea tridentata)* does not provide the sturdy structure required for nest placement of the Le Conte's Thrasher's nest. Therefore, this species is not usually found in areas of monotypic creosote bush scrub, as it provides little cover for nesting sites.

The Proposed Project site is dominated by creosote/bursage habitat and the Le Conte's Thrasher is not likely to occur within the area as there is no suitable nesting habitat present.

### Greater Roadrunner

The Greater Roadrunner (*Geococcyx californianus*), a signature desert inhabitant, is listed as a protected species under the MBTA. Although habitat is limited, the roadrunner is found in open arid and semiarid country with scattered brush.

Nesting occurs in thorny bushes, small trees or cacti. Urban encroachment, fragmentation, and intensity of human activity adjacent to remaining occupied habitat pose an increasing threat to roadrunner existence.

There are a number of causes responsible for the reduction in numbers of the Greater Roadrunner. The most deleterious threats are urban, suburban, and agricultural encroachment into remaining scrublands, which causes habitat fragmentation beyond the minimum patch size to sustain roadrunners. Other threats include construction of roads, illegal hunting, pesticide use, and predation by pets and feral animals.

The Greater Roadrunner was observed within the Proposed Project site as there is suitable habitat present.

### Red-tailed Hawk

The Red-tailed Hawk (*Buteo jamaicensis)* is protected under the MBTA. The Red-tailed Hawk is the most widespread and familiar of the soaring hawks (buteos) in North America (NDOW 2010b). In Nevada, the Red-tailed Hawk is found in the salt desert/Mojave desert. Wintering populations in Nevada are between 100-150 residents and are monitored on a triennial basis.

The Proposed Project site, as a whole, is quite open, and provides suitable hunting habitat for the Red-tailed Hawk. Red-tailed Hawks were observed over the site.

### Cactus Wren

The Cactus Wren (*Campylorhynchus brunneicapillus)* is protected under the MBTA. This wren inhabits southern Nevada amidst semi-desert and desert areas around cacti, yucca, mesquite, and brush. The cactus wren favors cholla for building nests and roosting. Within the Proposed Project site, Cactus Wrens are likely to occur in areas where vegetation is sparse and where chollas provide suitable nesting sites.

### Golden Eagle

The Golden Eagle is protected under the Bald and Golden Eagle Protection Act as well as the MBTA. Helicopter surveys completed in 2009 by NDOW indicate that suitable nesting and remnant nests occur in the Arrowhead Canyon area approximately 8-10 miles west of the Proposed Project. It is not likely that Golden Eagles will be impacted directly; however, they could be impacted indirectly through loss of potential foraging habitat. A quantitative assessment will be completed to determine potential indirect impacts to Golden Eagles as well as address mitigation measures.

### Gila Monster

This species is rarely observed relative to other species which is the primary reason for its Protected classification by the State of Nevada. The USDI Bureau of Land Management has recognized this lizard as a sensitive species since 1978. Most recently, the Gila monster (*Heloderma suspectum*) was designated as an Evaluation species under Clark County's Multiple Species Habitat Conservation Plan (MSHCP). The evaluation designation was warranted because inadequate information exists to determine if mitigation facilitated by the MSHCP would demonstrably cover conservation actions necessary to insure the species' persistence without protective intervention as provided under the federal Endangered Species Act.

The banded Gila monster (*H.s. cinctum*) is the subspecies that occurs in Clark, Lincoln, and Nye counties of Nevada. Found mainly below 5,000 feet elevation, its geographic range approximates that of the desert tortoise (*Gopherus agasizii)* and is coincident to the Colorado River drainage. Gila monster habitat requirements center on desert wash, spring and riparian habitats that inter-digitate primarily with complex rocky landscapes of upland desert scrub. They will use and are occasionally encountered out in gentler terrain of alluvial fans (bajadas). Hence, Gila monster habitat bridges and overlaps that of the desert tortoise. Gila monsters are secretive and difficult to locate, spending >95% of their lives underground.

Protection of and reporting of Gila Monsters, if found on-site during surveys, construction, or operations will be conducted under NDOW protocol (NDOW 2007) as described in the Chapter 5, Mitigation Measures.

### White Bear Poppy

The white bear poppy (*Arctomecon merriamii*) is an evergreen perennial herb that blooms from April through July. This species is found in Nevada from Clark, Nye, and Lincoln counties on wide variety of dry to sometimes moist basic soils, including alkaline clay and sand, gypsum, calcareous alluvial gravels, and carbonate rock outcrops in chenopod scrub and rocky Mojavean desert scrub from 1,600 to 6,280 feet. The Mojave creosote bush-white bursage (burro-weed) desert scrub in the Proposed Project area may provide habitat for this species. Pre-construction surveys for the white bear poppy will be completed prior to any construction activities within the Proposed Project area where suitable habitat exists.

### Three Corner Milkvetch

Three-corner milkvetch (*Astragalus geyeri var. triquetrus*) is a short, spindly, but upright annual forb with pinnately divided leaves. The small pea-flowers are white, but the defining character is the 3-cornered seedpod.

Three-corner milkvetch is an uncommon component of desert vegetation in the Mojave Desert Scrub community on wind-blown sandy soils. Around Las Vegas, this species may be found northeast of town in Dry Lake Valley and in the Valley of Fire State Park. This species does not appear every year, requiring wetter than average seasons to germinate. Pre-construction surveys for the three-corner milkvetch will be completed prior to any construction activities within the Proposed Project area where suitable habitat exists.

### Sticky Buckwheat

Sticky buckwheat (*Eriogonum viscidulum)* is a tall, erect and spreading annual, 1.6 to 13.1 feet (0.5 to four meters) high and minutely viscid. Leaves are basal with leaf blades being elliptic to broadly ovate. This buckwheat is found in Clark and Lincoln counties, Nevada and northwestern Arizona (NNHP 2001). Populations occur along the Muddy River from Weiser Wash to its confluence with the Virgin River and within the Virgin River drainage. This species overlaps with Three-corner milkvetch over much of its range. Pre-construction surveys for the sticky buckwheat will be completed prior to any construction activities within the Proposed Project area where suitable habitat exists.

### Beaverdam Breadroot

Beaverdam breadroot (*Pediomelum castoreum)* is a herbaceous perennial in the pea (Fabaceae) family. It reaches up to 6.3 inches (16 centimeters) in height. This species is a low-growing, single-stemmed, deep-rooted, herbaceous perennial with glabrous, slender stems. This species is endemic to the Mojave Desert region and is found within an elevation range from 1,279.5 to 5,000 feet. This species is associated with desert shrub vegetation and pinyon-juniper woodland. The species can be found in sand or sandy gravel in open areas and on road cuts. Pre-construction surveys for the beaverdam breadroot will be completed prior to any construction activities within the Proposed Project area where suitable habitat exists.

### Rosy Twotone Beardtongue

The rosy twotone beardtongue (*Penstemon bicolor* ssp. *roseus*) is a perennial herb known in Nevada from Clark and Nye counties. This species is found on rocky, calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runoff in the creosote-bursage, blackbrush, mixed-shrub, Joshua tree woodland, and Mojavean desert scrub from 1,800 to 4,839 feet. The Mojave creosote bush-white bursage (burro-weed) desert scrub in the Proposed Project area may provide habitat for this species. Pre-construction surveys for the Rosy twotone beardtongue will be completed prior to any construction activities within the Proposed Project area where suitable habitat exists.

### 3.8.4. Ecosystems and Biological Communities

The climate of the Great Basin-Mojave Desert region is one of the most varied and extreme in the world (Hidy and Klieforth 1990) (NDOW 2006).

The harsh conditions and abundant xerophytic and halophytic vegetation types associated with the Mojave Warm Desert Scrub, would, at first glance, give the impression of a somewhat inhospitable and uninviting habitat (NDOW 2006). However, a large complement of wildlife species, including many bird, small mammal and reptile species depend on or at least partially use Mojave Warm Desert Scrub habitat, as well as other nearby habitats (NDOW 2006).

Mammals, reptiles, and birds are among the wildlife found in the community. Common organisms found within the desert environment are: desert tortoise, coyotes, desert kit fox, snakes, hares, lizards, gophers, mice, bats, birds, and porcupines. There are a myriad insects that are a vital resource for other wildlife as well as important pollinators for the variety of vegetation. General types of insects are moths, butterflies, ants, beetles, spiders, grasshoppers, crickets, and praying mantids.

The dominant plant association present in the Proposed Project site is the desert creosote bush and white bursage. This key habitat is critical to the survival of the federal and state threatened desert tortoise in Nevada (NDOW 2006). White bursage is a pioneer species and provides a stable environment for creosote bush to establish a foothold. Desert creosote bush grows in well-drained slopes and plains, especially those with a layer of caliche, up to 4,000 feet in elevation (Royo, No date) in an open community structure. The typical growth height is four feet, although some may reach up to 12 feet with an adequate water supply.

Many desert animals use creosote bush for shelter. Burrows are dug around and under creosote bushes by both reptiles and amphibians. Roots of creosote bush stabilize the soil and support burrows of the desert tortoise. Large kit fox den complexes are often found in association with creosote habitat for the same reason (NDOW 2006). Most animals bed in or under the bushes as well as use them for perching or nesting. Creosote bush enables animals to escape the harsh sun and extreme temperatures as well as provides cover and escape from predators. Creosote bush is browsed by many small mammals. The foliage, twigs and seeds are readily consumed as a food source.

White bursage commonly grows on arroyos, bajadas, gentle slopes, valley floors, and sand dunes at elevations up to 3,000 feet (900 m) throughout the Sonoran and Mojave Deserts (USDAFS 2010). White bursage is a desert shrub growing up to two feet tall and spanning three feet in width. White bursage is of intermediate forage value (USDAFS 2010). White bursage plants, seedlings, and seeds are a food source for black-tailed jackrabbits. Desert rodents, such as the kangaroo rat, also consume the seeds.

Saltbush scrub and cactus-yucca habitats are also common in the Proposed Project site. Fourwing saltbush is a common occupant in early succession. However, it is also found late in successions dominated by sagebrush. Saltbush growth can reach up to 15 feet high, depending on the amount of water available, though they commonly grow two to three feet high. Saltbush provides food and shelter for desert wildlife. Fourwing saltbush is a valuable forage shrub because it is abundant, palatable, provides large quantities of forage, is nutritious, and grows rapidly (USDAFS, no date). Leaves, stems and fruits provide browse throughout the year (USDAFS, no date).

Throughout the Mojave Desert the native understory is being replaced with non-native species such as are red brome (*Bromus rubens*), cheatgrass (*Bromus tectorum*), Sahara mustard, halogeton and Russia thistle (*Salsola collinear*). Non-native annual grass species such as red brome, cheatgrass, and Mediterranean grass (*Schismus barbatus*) compete with native forage plants for which the desert tortoise depends (IWAC 2006). New concerns have arisen because these invasive plants have proliferated to an extent capable of significantly altering the Mojave scrub fire return interval from centuries (~500 years) to decades, causing an irreversible shift in plant communities, and putting maintenance of the ecosystem at risk (NDOW 2006). High temperatures and oxygen depletion caused by these fires can kill individual tortoises, but it is habitat alteration that appears to have the most wide-ranging impact (IWAC 2006). The tortoises and other wildlife that do survive fires are forced to survive on non-native grasses, which is of decreased nutritional value as compared to the native vegetation. Furthermore, the consequence of loss of perennial shrubs leaves tortoises and other wildlife with very little shade to escape the desert sun.

The biggest challenge facing wildlife in the Mojave Warm Desert Scrub is conversion of habitat through urban and suburban development (NDOW 2006). Human population growth, construction, mining, off-road vehicle use, and invasive species are all contributing factors that result in loss or degradation of habitat. Furthermore, overharvesting of highly desirable reptiles is of great concern. Susceptible reptiles include chuckwallas, collared lizards and desert iguanas.

### 3.8.5. Agriculture

Farming operations are located along the Muddy River valley floor with limited farming activities away from water sources. There is no farming operation within a 10-mile radius of the Proposed Project.

### 3.8.5.1. Prime and Unique Farmland

No Prime or Unique Farmlands were identified within the Proposed Project (NRCS 2007).

## 3.9. Cultural Resources

This section briefly discusses the past cultural resource investigations that have been conducted in the area and the known cultural resource sites that have been documented in the general area of the Proposed Project. The next chapter will discuss potential impacts to current cultural or religious properties and prehistoric or historic cultural sites that may qualify as historic properties. Appendix G contains the Cultural Resource report citation, letters to tribes, and consultation letters with the State Historic Preservation Office. Historic properties are districts, sites, buildings, structures, or objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that are currently listed on the National Register of Historic Places (NRHP) or are potentially eligible for listing. Districts, sites, buildings, or structures that are listed or eligible for listing may include components that do not support or contribute to that eligibility. These non-contributing components may be associated with or may be parts of a historic property, but are not considered significant and are not considered historic properties. Under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR 800), any federal undertaking (an undertaking involving federally administered lands, funds, approval, permits, or oversight) must consider potential impacts to historic properties.

Compiled information on previous investigations in the study area includes 51 previous cultural resource investigations of varying sizes. These provide baseline and comparative information on the types of sites that have been found in the area. The entire area of potential effect (APE) for the Proposed Project has been covered by an intensive pedestrian inventory documented in BLM Cultural Resource Report No. 5-2669 in 2011. One previous survey in 2006 inventoried 1,202 acres of the proposed lease area and the current inventory surveyed 909 total acres to cover the remaining APE for this Proposed Project. The latest inventory resulted in only one new prehistoric site (26CK9415) and two isolated finds being recorded. 26Ck9415 was evaluated and found to be non-eligible for listing on the National Register of Historic Places. Isolated finds are normally considered non-eligible.

### 3.9.1. Historic, Cultural, and Religious Properties

Most of the Proposed Project is located on the Reservation, which was established in1872 in response to Southern Paiute conflicts with the Mormons and the United States, and a flurry of mining claims around Pioche and Panaca in the 1860s. The transmission line corridor follows the BLM designated utility corridor with the south end connecting to the

Crystal substation (just under 0.5 mile) on BLM land. The portions of the Reservation containing the Proposed Project do not contain sites or resources identified by the Tribe as having historic, cultural or religious significance. There are no documented extant historic buildings in the study area. Extant historic structures in the study area are limited to the historic Union Pacific-Southern Pacific Railroad (26CK5685); a historic segment of US Highway 91 (26CK5020); and an unnamed historic road segment (26CK8532). None of these resources will be affected by the Proposed Project. A segment of the Old Spanish Trail/Mormon Road crosses near the project area to the north and the Old Spanish National Historic Trail, managed jointly by the BLM and National Parks Service, as defined by 16 USC 1251 is located on the south side of I-15. Inquiries to the National and local chapters of the Old Spanish Trail Association regarding the Old Spanish National Historic Trail and related corridors in the Proposed Project area resulted in concurrence that there would be no physical or visual effects to any eligible or significant historic trails. Visual impacts to the Old Spanish National Historic Trail from the northern Old Spanish Trail/Mormon Road crossing and the segment that lies on the east side of I-15 will be addressed.

### 3.9.2. Tribal Consultation

Prior to a cultural resource survey of the lease area, ARCADIS met with the Moapa Paiute Tribe Cultural Resource Committee. The meeting included discussion of proposed survey methods for the cultural resource survey, preliminary arrangements for tribal members to accompany the archaeologists, and a discussion of whether there were any sites of traditional, cultural or religious concern in the Proposed Project area that would need to be considered for project planning. The Tribe did not identify any sensitive sites or resources. This meeting was not considered a formal government-to-government consultation because no federal government agency was represented at the meeting.

The BIA sent letters to eight Tribes in the region inquiring if there were any concerns about the effects of the Proposed Project on historic properties or areas of traditional or cultural importance. These Tribes included the Las Vegas Paiute Tribe, Kaibab Band of Paiute Indians, Hualapai Indian Tribe, Fort Mojave Indian Tribe, Hopi Tribe, Colorado River Indian Tribes, Chemehuevi Indian Tribe, and Paiute Indian Tribe of Utah. The Hopi tribe responded that it would be interested in further consultation if the Proposed Project would potentially have an adverse effect on prehistoric Ancestral Puebloan sites.

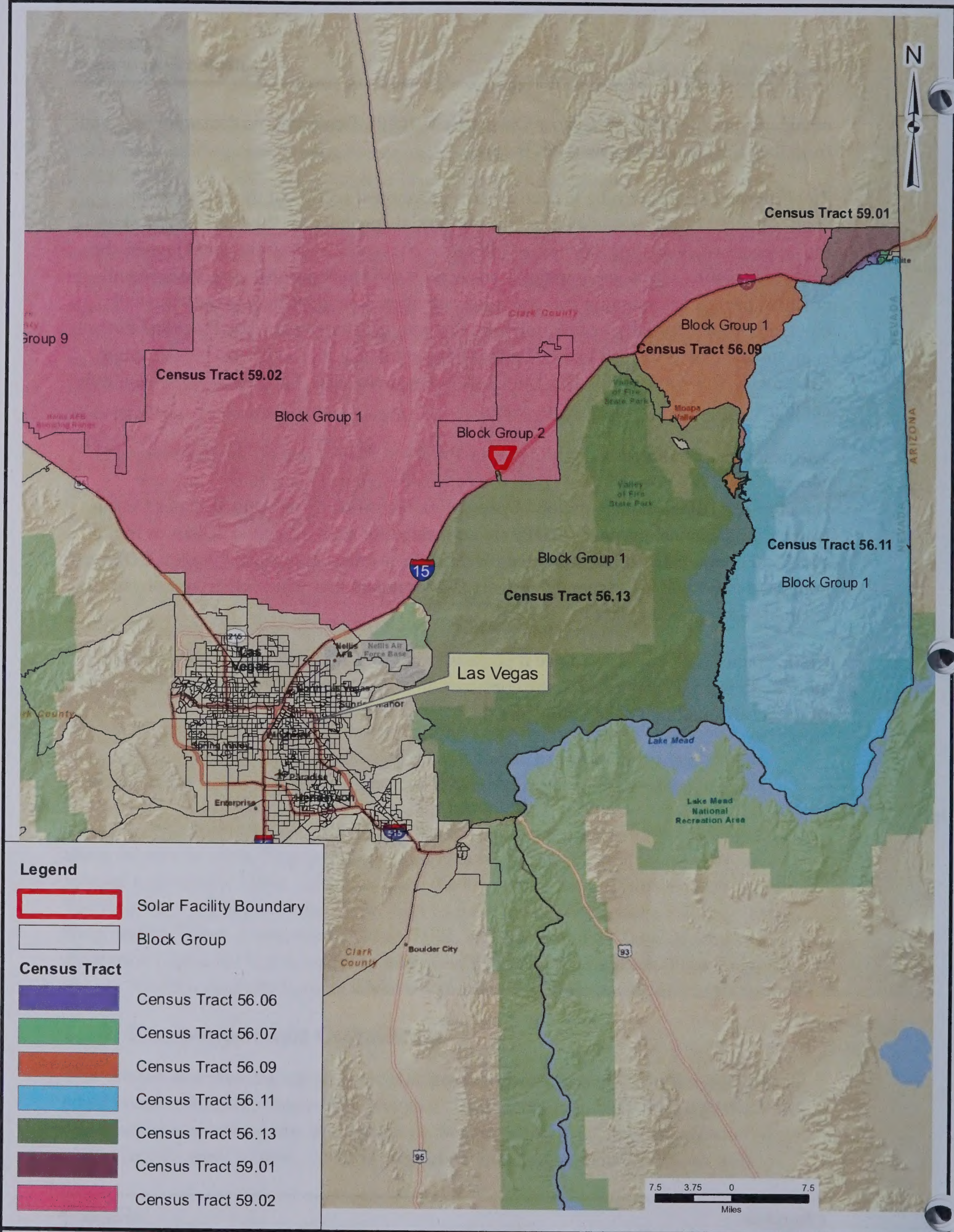
## 3.10. Socioeconomic Conditions

This section describes the existing socioeconomic conditions and environmental justice populations within the Proposed Project area. These conditions focus on population and employment/unemployment, demographics, housing supply, social and public services, and recreation opportunities. General population and employment conditions were obtained from the 2010 US Census Data (USCB 2010). Demographic data were obtained from the U.S. Census Bureau (USCB 2000).

The Proposed Project will be located on an undeveloped section of the Reservation approximately 12 miles southwest of the residential epicenter for the Reservation. For the purposes of evaluating existing conditions with respect to environmental justice, the study area is the Census geographies (census tract and block groups) encompassing all potential project construction and operation activities. The identified census tract and block groups are partially or fully incorporated into the study area. The Proposed Project is located in census tract (CT) 59.02 and is adjacent to CT 56.13 and two block groups (BG) 59.02, BG 2 and 56.13, BG 1 in Clark County, Nevada. The Reservation is entirely contained within CT 59.02 (Figure 3-10).

The nearest incorporated community to the Proposed Project and off the Reservation is Moapa Town, Nevada. Moapa Town is a census-designated place (CDP) in Clark County. A CDP is a concentration of population identified by the United States Census Bureau for statistical purposes. CDPs are delineated for each decennial census as the statistical counterparts of incorporated places such as cities, towns and villages. CDPs are populated areas that lack separate municipal government, but which otherwise physically resemble incorporated places.

Clark County is also profiled since it physically borders the Reservation. Some of the labor and materials employed in the construction of the Proposed Project will be sourced from the surrounding Clark County area.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Census Tract 59.01
Group 9
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Clark County
Block Group 2
Block Group 1
Census Tract 56.09
Valley of Fire State Park
Moapa Valley
NEVADA
ARIZONA
Census Tract 56.11
Block Group 1
Block Group 1
Census Tract 56.13
15
Nellis AFB
Nellis Air Force Base
Las Vegas
North Las Vegas
Sunrise Manor
Spring Valley
Paradise
Enterprise
Henderson
Lake Mead
Lake Mead National Recreation Area
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Census Tract 56.11
Census Tract 56.13
Census Tract 59.01
Census Tract 59.02

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

| MALCOLM PIRNIE | K Road Power<br>San Diego, California<br>K Road Moapa Solar Project | Moapa River Indian Reservation<br>2010<br>Census Data | MALCOLM PIRNIE, INC.<br>September 2011<br>FIGURE 3-10 |
|---|---|---|---|

### 3.10.1. Definition of Resource

A socioeconomic analysis looks at impacts on local finances from taxes as well as potential adverse impacts on public services. Environmental justice looks at whether federal programs, policies, and activities have a disproportionately high and adverse impact on minority and/or low-income populations. For the purposes of environmental justice, minority refers to anyone who is racially classified as African American, Asian American, Native American or Alaskan Native, or Pacific Islander, anyone who self-classifies as "other" race, or two or more races, or anyone classified as Hispanic. Hispanic is considered an ethnicity, not a separate race; Hispanics are considered minorities regardless of their racial self-affiliation. A minority population is identified when the minority population of the potentially affected area is greater than 50 percent or meaningfully greater than the percentage of the minority population in the general population or other appropriate unit of geographical analysis. Low income is determined by a set of money-income thresholds that varies by family size and composition. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as low- income, or "below the poverty level," at the time of the census.

### 3.10.2. Employment and Income

As of the census of 2000, there were 928 people, 273 households, and 220 families residing in the Moapa Town CDP and there were 867 people, 318 households, and 250 families residing in CT 59.02 (Reservation). The population density was 6.2 people per square mile (2.4/km²). There were 310 housing units at an average density of 2.1/sq mi (0.8/km²). In Moapa Town there were 273 households out of which 51.3% had children under the age of 18 living with them, 65.9% were married couples living together, 9.9% had a female householder with no husband present, and 19.4% were non-families. Approximately 14% of all households were made up of individuals and 4.4% had someone living alone who was 65 years of age or older. The average household size was 3.40 and the average family size was 3.81.

In CT 59.02 there were 318 households out of which 41.2% had children under the age of 18 living with them, 58.5% were married couples living together, 9.1% had a female householder with no husband present, and 21.4% were non-families. 16.7% of all households were made up of individuals and 5.3% had someone living alone who was 65 years of age or older. The average household size was 2.73 and the average family size was 3.03.

In the CDP the population was spread out with 38.8% under the age of 18, 7.7% from 18 to 24, 26.8% from 25 to 44, 19.5% from 45 to 64, and 7.2% who were 65 years of age or older. The median age was 29 years. For every 100 females there were 106.7 males. For every 100 females age 18 and over, there were 100.7 males.

Table 3-14 shows the median household income and percentage of the population living in poverty according to the U.S. 2000 Census for the geographic comparison areas. In 1999, the median household incomes for the United States, Nevada, and Clark County were similar at $41,994, $44,581, and $44,616, respectively. The median income for a household in the Moapa Town was $48,365, and the median income for a household in the CT 59.02 was $44,250.

CT 59.02 had 11.4 percent living below poverty level, Moapa Town had 3.1 percent below poverty line, Clark County had 10.8 percent living below poverty level, and the State of Nevada had a 10.5 percent poverty rate. These are all lower than the national poverty status of 12.4 percent. Within the study area income data supports the conclusion that there are no environmental justice communities defined by income. Native American persons residing on the Reservation and within the Proposed Project area are considered an eligible environmental justice community as defined by Executive Order 12898.

Data from the U.S. Census Bureau's 2000 Census of Population and Housing as presented in the U.S Census Bureau's American Fact Finder were used to determine minority and impoverished populations. Clark County median and per capita incomes exceed the U.S. average, although 10.5 percent of the individuals within the county have incomes that are below the poverty level threshold. Total personal income shows that the county accounts for 70 percent of the total wealth of the state. Typically, an impoverished community is defined as one in which more than 20 percent of the population is below the poverty level. For a single person (not a family) the poverty income threshold is $10,830. For a family of four with two children under the age of 18, the poverty income threshold is $22,050. Moapa Town, CT 59.02 Moapa Indian Reservation, CT 56.13, and Clark County's mean incomes are above the current 2009 Department of Health and Human Services poverty threshold.

**Table 3-14.**
**Median Household Income**

| Geographic Area | Median Household Income in 1999 dollars | Total Population | Number with income in 1999 below poverty level | Percent of total population below the 1999 poverty level |
|---|---|---|---|---|
| United States | $ 41,994.00 | 273,882,232 | 33,899,812 | 12.4% |
| State of Nevada | $ 44,581.00 | 1,962,948 | 205,685 | 10.5% |
| Clark County, Nevada | $ 44,616.00 | 1,355,075 | 145,855 | 10.8% |
| Moapa Town | $ 48,365.00 | 928 | 32 | 3.1% |
| CT 56.13 | $ 45,417.00 | 4222 | 275 | 6.5% |
| CT 59.02 Moapa Indian Reservation | $ 44,250.00 | 1589 | 181 | 11.4% |

Source: USCB 2000

The Clark County economy is heavily dependent on the leisure and hospitality sector, as well as closely linked supporting sectors in arts, entertainment, and retail trade establishments. In addition, hotel and resort renovation, development, and expansion within Las Vegas have traditionally been a mainstay of the Clark County economy. The recession has had a major negative impact on construction employment and has also affected most industries within the county. Table 3-15 shows the distribution of employment by industry within Clark County, FY 2009.

**Table 3-15.**
**Employment by Industry**

| Industry | Nevada | Clark County | Moapa Town | CT 56.13 BG 1 | Moapa Reservation, CT 59.02 |
|---|---|---|---|---|---|
| Total All Industries | 933,280 | 637,339 | 360 | 1,596 | 571 |
| Agriculture, forestry, fishing, and hunting, and mining | 14,938 | 1,724 | 7 | 38 | 63 |
| Construction | 86,327 | 62,115 | 119 | 252 | 129 |
| Manufacturing | 45,794 | 23,478 | 22 | 34 | 40 |
| Wholesale trade | 25,121 | 15,064 | 8 | 22 | 9 |
| Retail Trade | 105,382 | 71,237 | 3 | 127 | 13 |
| Transportation and warehousing, and utilities | 48,102 | 32,410 | 25 | 134 | 36 |
| Information | 20,969 | 14,464 | 6 | 31 | 6 |

Table 3-15 Continued

| Industry | Nevada | Clark County | Moapa Town | CT 56.13 BG 1 | Moapa Reservation, CT 59.02 |
|---|---|---|---|---|---|
| Finance, insurance, real estate, and rental and leasing | 60,216 | 43,631 | 0 | 91 | 8 |
| Professional, scientific, management, administrative, and waste management services | 82,172 | 58,783 | 11 | 79 | 11 |
| Education, health and social services | 119,967 | 74,923 | 76 | 253 | 105 |
| Arts, entertainment, recreation, accommodation and food services | 245,679 | 191,596 | 45 | 313 | 67 |
| Other services (except public administration) | 36,742 | 24,656 | 34 | 75 | 34 |
| Public administration | 41,871 | 23,258 | 4 | 147 | 50 |

### 3.10.3. Unemployment

According to 2000 Census Bureau data the unemployment rate for the Reservation is approximately double that for Clark County and that state of Nevada. Table 3-16 shows the comparison between the various state, regional and local unemployment rates as well as total reported labor force. The unemployment rate for Nevada in August 2011 was 13.4 and both Clark County and Las Vegas in August 2011 was 14.2 percent.

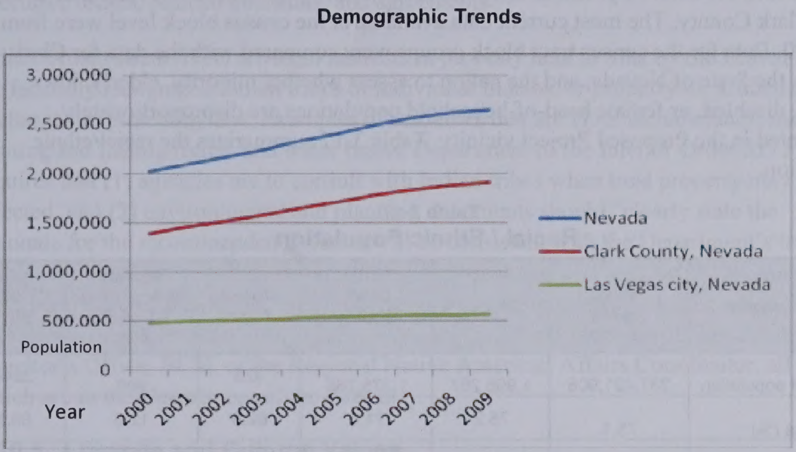
Table 3-16:
Unemployment Rates

| | Nevada | Clark County, Nevada | Moapa Town CDP, Nevada | Census Tract 56.13, Clark County, Nevada | Census Tract 59.02, Clark County, Nevada | Tribal Census Tract 59.02; Moapa River Indian Reservation |
|---|---|---|---|---|---|---|
| Labor Force | 1,003,293 | 688,917 | 377 | 1,696 | 641 | 96 |
| Employed | 933,280 | 637,339 | 360 | 1,596 | 571 | 85 |
| Unemployed | 61,920 | 44,734 | 17 | 100 | 41 | 11 |
| Unemployment Rate | 6.17 | 6.49 | 4.51 | 5.90 | 6.40 | 11.46 |

Source: Census Bureau 2000

### 3.10.4. Demographic Trends

Between 2000 and 2009 the region grew rapidly, in line with the growth experienced by the metropolitan Las Vegas area. Average annual population growth rates have exceeded 2 percent per annum over the last several years and demographers expect this pace to continue. Nevada demographers expect that Clark County's population will increase to 2.7 million by 2020 and rise to 3 million persons by 2028 (Nevada State Demographer's Office 2008). With the growing population there is a greater need for electricity throughout the Nevada. The graph below shows the population growth in Nevada, Clark County and Las Vegas.



### 3.10.4.1. Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to make achieving environmental justice part of their mission. The order requires the EPA and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

The percent Hispanic or Latino of total population of the United States, Nevada, and Clark County is 12.5 percent, 19.7 percent, and 22.0 percent, respectively. Of the minority population in the United States, Nevada, and Clark County, the percent of the minority population that is American Indian or Alaska Native alone is 3.5 percent, 5.3 percent, and 2.8 percent, respectively.

The residents on the Reservation represent the closest environmental justice population to the Proposed Project. As Native Americans, the residents on the Reservation meet the criteria of a minority population and thus are subject to environmental justice consideration under the Executive Order.

Reference areas were identified to compare larger geographic areas with census blocks groups for the Proposed Project vicinity to determine whether populations residing in the affected area constitute a potential environmental justice population. The reference area is north Clark County. The most current data available at the census block level were from FY 2000. Data for the census tract block groups were compared with the data for Clark County, the State of Nevada, and the nation to assess whether minority, elderly, low-income, disabled, or female head-of-household populations are disproportionately represented in the Proposed Project vicinity. Table 3-17 summarizes the racial/ethnic population.

**Table 3-17.**
**Racial / Ethnic Population**

| Population | United States | Nevada | Clark County | Moapa Town | Moapa Reservation, CT 59.02 BG 2 | CT 56.13 BG 1 |
|---|---|---|---|---|---|---|
| Total population | 281,421,906 | 1,998,257 | 1,375,765 | 928 | 206 | 2244 |
| White (%) | 75.1 | 75.2 | 71.6 | 62.9 | 12.6 | 89.5 |
| Black or African American (%) | 12.3 | 6.8 | 9.1 | 0.2 | 0.5 | 1.1 |
| American Indian and Alaska Native (%) | 0.9 | 1.3 | 0.8 | 1.4 | 80.1 | 0.8 |
| Asian (%) | 3.6 | 4.5 | 5.3 | 1.8 | 0.0 | 0.0 |
| Native Hawaiian and Other Pacific Islander (%) | 0.1 | 0.4 | 0.5 | 0.6 | 0.0 | 0.0 |
| Some other race (%) | 5.5 | 8 | 8.6 | 30.5 | 4.9 | 5.8 |
| Two or more races (%) | 2.4 | 3.8 | 4.2 | 2.5 | 1.9 | 2.1 |
| Hispanic or Latino (%) | 12.5 | 19.7 | 22 | 35 | 15.0 | NA |

Table Source: UCSB 2000.
Table Key: % = percent; BG = Block Group; CT = census tract.

The Reservation is the closest community to the project, 80.1 percent Native American; therefore, the Proposed Project is not expected to have disproportional impacts to minorities.

### 3.10.4.2. Indian Trust Assets

Federally-recognized Indian tribes are domestic, sovereign nations, and the relationship between the federal government and those tribes is characterized as one of trustee. As part of this role, the federal government is obligated to protect tribal interests, a duty that is referred to as trust responsibility. This trust doctrine is defined through treaties, laws, executive orders, judicial decisions, and agreements.

Indian Trust Assets (ITA) are legal interests in property held in trust by the United States for federally recognized Indian tribes or individual Indians, or property the United States is charged to protect by law. Examples of resources that are ITAs include lands, minerals, hunting and fishing rights, and water rights. Department of the Interior Order 3175 requires that (1) agencies are to consult with Indian tribes when trust property may be affected, and (2) environmental and planning documents should "clearly state the rationale for the recommended decision will be consistent with the Department's trust responsibilities." ITAs should be considered and identified early in the NEPA process. ITA identification should involve consultation with (1) potentially affected tribes, Indian organizations or individuals, and (2) the BIA, the Office of American Indian Trust, the Solicitor's Office, BLM, or the Regional Native American Affairs Coordinator, all of which are in the Department of the Interior.

### 3.10.5. Lifestyle and Cultural Values

The Moapa People were a culturally well-adapted people who combined farming with hunting and gathering. They used the resources of the land with great ingenuity. Most of the domestic objects of their ancestors were various forms of intricately designed basketry, including water jars, winnowing and parching trays, cradle boards, cooking baskets, and seed beaters. They had great skill in the use of animal skins and plants. Their knowledge of nutritional and medicinal uses of plants was extensive (Moapa Paiutes, n.d.).

Today the Tribe's primary business enterprise centers on the Travel Plaza, which includes a casino, convenience store, cafe, gas station, and firework store. An opportunity to expand economic development and hold fast to historical beliefs through low-impact projects and respect for the care and longevity of tribal land is consistent with tribal values.

### 3.10.6. Limited English Proficiency

Executive Order 13166 "Improving Access to Services for Persons with Limited English Proficiency" requires all recipients of federal funds to provide meaningful access to persons who are limited in their English proficiency (LEP). The US Department of Justice defines LEP individuals as those "who do not speak English as their primary language and who have a limited ability to read, write, speak, or understand English" (67 FR 41459). Data about LEP populations were gathered from the U.S. Census 2000.

Within census tracts, cities and counties, the census records the presence of persons who describe their ability to speak English as less than "Very Well." Table 3-18 shows the number of adults who speak English less than "Very Well" by language category for Nevada, Clark County CT 56.13 BG 1, Moapa Reservation CT 59.02, and Moapa Town. Additionally, Moapa Reservation CT 59.02 has 48 individuals (over the age of 5) or 9.7% and Moapa Town has 24 individual (over the age of 5) or 8.7% that reported to the census that they spoke English less than "Very Well." Thus, Census data indicate the presence of LEP populations.

Thirty-seven percent of the people living in Moapa Town CDP in 2005-2009 were foreign born. Sixty-three percent were native, including 40 percent who were born in Nevada. Among people at least five years old living in Moapa Town CDP in 2005-2009, 76 percent spoke a language other than English at home. Of those speaking a language other than English at home, 100 percent spoke Spanish and less than 0.5 percent spoke some other language; 51 percent reported that they did not speak English "very well."

**Table 3-18.**

**Census Data: Number of Adult Speakers Who Speak English Less than Very Well***

| Household Language | Nevada | Clark County | CT 56.13 BG 1 | Moapa Reservation, CT 59.02 | Moapa Town |
|---|---|---|---|---|---|
| Total | 751,977 | 512,714 | 1,380 | 490 | 275 |
| English | 571,792 | 376,018 | 1,234 | 312 | 157 |
| Spanish: | 109,667 | 83,112 | 121 | 138 | 111 |
| Linguistically isolated | 31,496 | 24,690 | 0 | 48 | 24 |
| Not linguistically isolated | 78,171 | 58,422 | 121 | 90 | 87 |
| Other languages | 6,894 | 4,507 | 0 | 39 | 7 |
| Linguistically isolated | 1,101 | 843 | 0 | 0 | 0 |
| Not linguistically isolated | 5,793 | 3,664 | 0 | 39 | 7 |

Data Source: USCB 2000 as of March 17, 2011 for persons age 5 and older.

* The data on ability to speak English represent the Census respondent's own perception about his ability to speak English (United States Census 2000 Metadata).

A windshield survey did not reveal the use of any language but English on billboards, signs or placards within the Proposed Project site. Since English and Spanish are the dominant language within the Proposed Project any notices for public involvement will be in English and, if necessary, Spanish. It should be noted that the Proposed Project is not scoped to receive federal funding.

### 3.10.7. Community Infrastructure

This section describes the existing environmental conditions of public resources for the Proposed Project. Topics include municipal water supply, municipal wastewater treatment and disposal, solid waste disposal, telecommunications, natural gas, electricity, and public health and safety (police, fire, and emergency medical services). The general and site-specific profiles of Public Services contained herein provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in the Environmental Consequences section.

#### 3.10.7.1. Public Services

**Libraries**

The Las Vegas-Clark County Library District provides library services for northeast Clark County. The library district is funded through property taxes, sales taxes, and user fees. The Library District serves northeast Clark County with three libraries, one of which is located in Moapa Town.

**Parks and Recreation**

Clark County Department of Parks and Recreation provides a system of public parks, recreation and open space facilities throughout Clark County. Ron Lewis Park and the Moapa Community Center are located in Moapa Town.

**Schools**

Clark County School District provides public education services to the county. Northeast Clark County is served by two high schools, two middle schools, and three elementary schools. Ute Perkins Elementary School is located in Moapa Town.

**Police**

Las Vegas Metropolitan Police Department is responsible for providing police protection in northeast Clark County. The Police Department has a Resident Officer Program serving the communities of Bunkerville, Moapa Town/Glendale, and Moapa Valley with approximately eight officers. A command station is located in Overton. The Police Department works cooperatively with other law enforcement agencies in and around northeast Clark County. The Nevada Highway Patrol enforces traffic regulations on state routes in northeast Clark County and BLM rangers patrol federal lands in the Bureau's jurisdiction.

Moapa Tribal Police Department stationed on the Reservation patrols Reservation lands, roads, and all activities within the Reservation twenty-four hours a day. A staff of six, one dispatch, and five officers are employed at the station.

**Hospitals**
Health care is offered within the Reservation business area. Care is offered in cooperation with Indian Health Services. The health-care facility offers immunization, women and infant care, routine health screening, and a rabies clinic. Some emergency care can also be provided. Mesa View Regional Hospital in Mesquite, NV and North Vista Hospital in North Las Vegas, NV (both approximately 30 miles north and south, respectively) are the closest acute and critical care hospitals that can provide emergency services.

**Solid Waste**
In Moapa Town, solid waste is collected curbside weekly by Republic Services. The waste goes to the APEX Regional Waste Management Center located at 13550 N. US Highway 93 (approximately 19 miles northeast of the City of Las Vegas) Township 18 South, Range 64 East, Section 18. Twenty-one facilities are currently engaged in commercial disposal of RCRA Subtitle C hazardous waste, in the nation. The nearest hazardous waste facility to the Proposed Project is located 110 miles due west in Beatty, NV.

**Water and Septic**
The Moapa Valley Water District provides water service in Moapa Town, Glendale, Logandale, and Overton. Properties outside a service provider's areas may apply for individual water well permits from the NDWR. Most developed areas of northeast Clark County rely on septic systems although, in recent years, some new construction has used package treatment plants.

## 3.11. Resource Use Patterns

### 3.11.1. Utilities

The Proposed Project is located next to two utility and transportation corridors containing several electrical transmission lines (230kV NVE Harry Allen-Reid Gardner #1 and #2, 345kV NVE Harry Allen-Red Butte, 500kV NVE Crystal-Navajo, and 500kV IPP HVDC Intermountain), and two natural gas pipelines owned by Kern River Gas Transmission, the Union Pacific railroad, and I-15. Multiple power plants within a 20 miles radius include the Apex Generating Station, the Chuck Lenzie Generating Station. the Harry Allen Generation Station, the Reid Gardner Generating Station and the proposed Harry Allen Expansion. The Proposed Project would interconnect to NV Energy's Crystal substation. The interconnections would allow both Nevada and California utilities to purchase renewable energy generated by the Proposed Project. The Applicant is actively marketing the Proposed Project's output to utilities in both Nevada and California and will have one or more Power Purchase Agreement(s) (PPAs) in place for the output before it is constructed.

The utility corridor is a "planned use" for utilities managed by the BLM. The Proposed Project site is located in an area predefined by the Tribe for economic development. The Proposed Project is adjacent to BLM lands slated for renewable (solar) development.

Clark County has implemented land use plans for the Northeast County which encompasses the Reservation. Northeast County is an unincorporated planning area administered by Clark County. It includes the communities of Bunkerville, Glendale, Logandale, Moapa, Moapa Valley, Mesquite and Overton. These plans were adopted on September 6, 2006 and indicate the land surrounding the Reservation is identified as Open Lands, Industrial and Heavy Industrial land use type.

### 3.11.2. Airports

There are nine registered airfields within 50 miles of the Proposed Project (see Figure 3-11): Perkins Field Airport, Echo Bay Airport, Nellis Air Force Base, North Las Vegas Airport, Mc Carran International Airport, Henderson Executive Airport, Mesquite Airport, Boulder City Municipal Airport, and Creech Air Force Base. Each is discussed below.

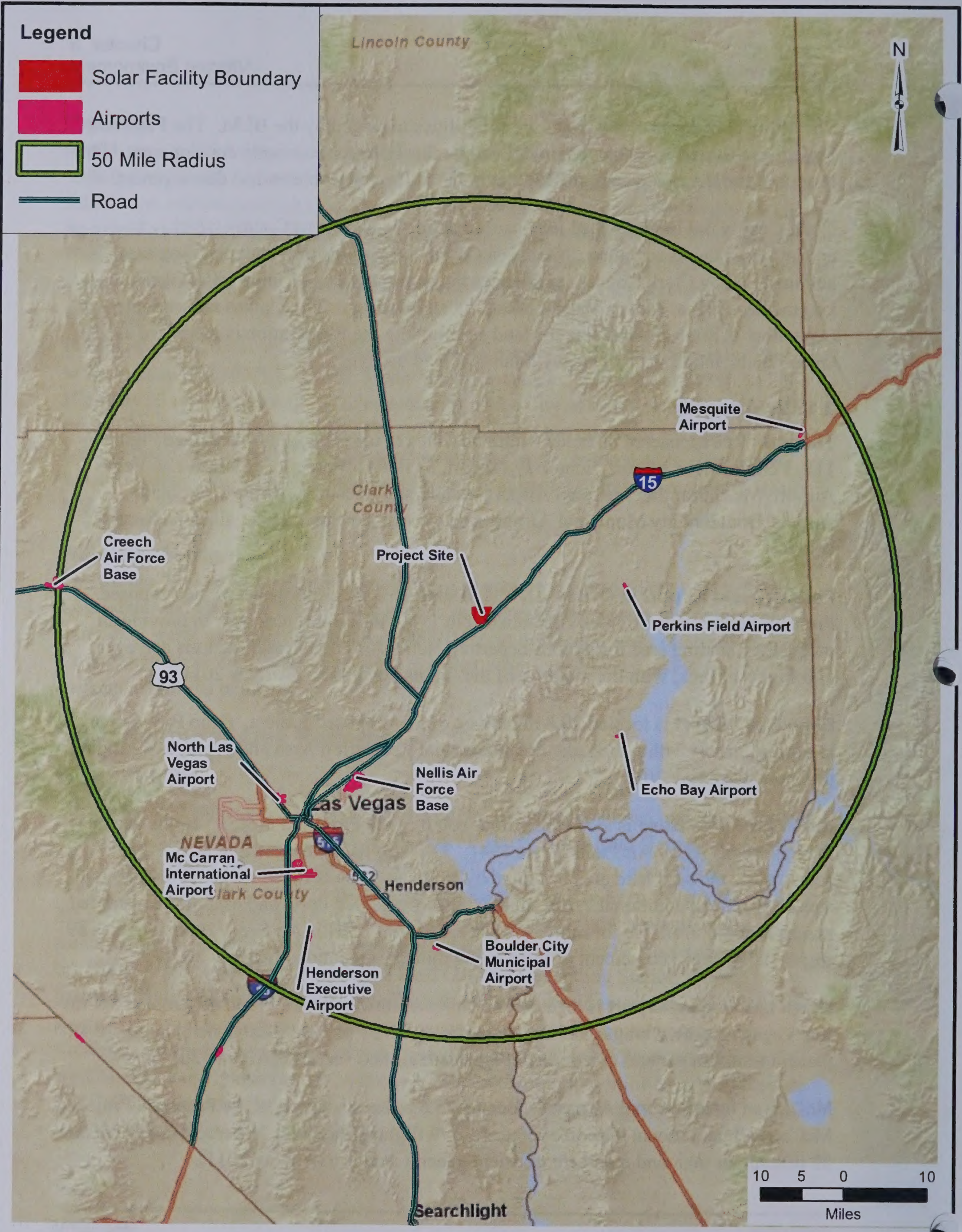
**Perkins Field Airport** in Overton, NV is located 16.3 miles northeast of the Proposed Project. Perkins was originally established in 1947, the airport was built to provide an emergency landing area for aircraft departing Nellis Air Force Base. Perkins averages 100 flights a week, with the majority of the flights being local (AirNav 2011).

**Echo Bay Airport** is located 20.8 miles east of the Proposed Project. Echo Bay Airport is a small airport within the Lake Mead National Recreation Area and averages 42 flights per month (AirNav 2011).

**Nellis Air Force Base** is located 23 miles south of the Proposed Project. Nellis began as the Las Vegas Army Air Field in late 1941. The base itself covers more than 14,000 acres, while the total land area occupied by Nellis and its restricted ranges is about 5,000 square miles. An additional 7,700 square miles of airspace north and east of the restricted ranges are also available for military flight operations. Nellis Air Force Base averages 89 flights a day with 100 percent of them being military operations (AirNav 2011).

**North Las Vegas Airport** is located 31.5 miles southwest of the Proposed Project. North Las Vegas Airport averages 384 flights per day with 53 percent local general aviation, 40 percent transient general aviation, and 7 percent air taxi services (AirNav 2011).

**McCarran International Airport** is located 35.6 miles southwest of the Proposed Project. McCarran International Airport averages 1,399 flights a day with 70 percent commercial, 22 percent air taxi, and 6 percent transient general aviation (AirNav 2011).


Legend
🟥 Solar Facility Boundary
🟥 Airports
🟩 50 Mile Radius
Road
Lincoln County
N
Mesquite Airport
15
Clark County
Creech Air Force Base
Project Site
Perkins Field Airport
93
North Las Vegas Airport
Nellis Air Force Base
Las Vegas
Echo Bay Airport
NEVADA
Mc Carran International Airport
Clark County
Henderson
Boulder City Municipal Airport
Henderson Executive Airport
Searchlight
10 5 0 10
Miles

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Facility

Moapa River Indian Reservation

Airport Location Map

MALCOLM PIRNIE, INC.

September 2011

FIGURE 3-11

**Henderson Executive Airport** is located south of Las Vegas and 42 miles southwest of the Proposed Project. Henderson Executive Airport averages 195 flights per day with 56 percent transient general aviation, 31 percent local general aviation, and 14 percent air taxi services (AirNav 2011).

**Mesquite Airport** in Mesquite, NV is located 42 miles northeast of the Proposed Project. Mesquite Airport averages 41 flights per day with 86 percent transient general aviation, and 13 percent local general aviation (AirNav 2011).

**Boulder City Municipal Airport** in Boulder City, NV is located 38 miles south of the Proposed Project. Boulder City Municipal Airport averages 274 flights per day with 70 percent air taxi, 20 percent local general aviation, and 10 percent transient general aviation (AirNav 2011).

**Creech Air Force Base** in Indian Springs, Nevada is located 49 miles west of the Proposed Project. Creech Air Force Base was being used as a divert field and base for air-to-air gunnery training for Nellis; however, now it is home to the 432d Wing that conducts Remotely Piloted Aircraft Systems (RPA) training. Creech Air Force Base averages 77 flights per week with 100 percent of them being military operations (AirNav 2011).

### 3.11.3. Hunting, Fishing, Gathering

Given the industrial nature of the utility corridor and vicinity of the proposed solar facility to I-15 and the Travel Plaza, no hunting, fishing or gathering is assumed or reported by the Tribe in the vicinity of the Proposed Project.

### 3.11.4. Grazing Allotments

The site is located on the Reservation which has no grazing allotments. The proposed up to 500 kV ROW crosses BLM managed property and is on 0.5 miles of BLM land. The BLM administers and manages the grazing allotments on public lands in the vicinity of the Proposed Project. The Proposed Project's 500 kV ROW would cross through the Dry Lake (Allotment Number 15416) and Roach Lake (Allotment Number 02007) grazing allotment.

### 3.11.5. Mining

The Proposed Project is located within the Moapa Mining District. The Nevada Bureau of Mines and Geology lists the historical commodities in this district to be gypsum, volcanic ash, tin, silica, sand and gravel, and uranium (Stewart and Carlson 1978). Three mining claims are located within five miles of the Proposed Project. The first is north of the Proposed Project and is a surface stone quarry, the second is due west of the Proposed Project and is a surface quarry for limestone, and the third one is east across I-15 from the Proposed Project and is a surface quarry for Gypsum-Anhydrite. None of the three sites are listed as active. In addition, the Lewis Concrete Sand plant, Las Vegas Gypsum plant and the Logandale Cement plant are located 12.7 miles, 14.9 miles, and 15.2 miles away from the Proposed Project, respectively.

### 3.11.6. Transportation Networks

This section identifies existing transportation and motorized vehicle access conditions at the Proposed Project. The Proposed Project is located in a largely undeveloped area; therefore, major transportation routes are limited. Traffic routes within the Proposed Project are limited to unpaved off-highway vehicle (OHV) roads, trails, and dry washes. I-15 and Las Vegas Boulevard would provide indirect access to the Proposed Project from the urban center of Las Vegas from the south. The Transportation study was completed in May 2011.

#### 3.11.6.1. Existing Traffic Volumes

Annual Average Daily Traffic (AADT) is defined as the total volume of traffic passing a point or a segment of a highway facility in both directions for one year divided by the number of days in the year (Traffic Research Board 2005). AADT figures are calculated by the Nevada Department of Transportation (NDOT) to assist in the determination of average traffic volumes at particular points along state roads throughout Clark County and the State of Nevada. The closest points to the Proposed Project (that have AADT figures published by NDOT from Annual Traffic Report) are summarized in Table 3-19.

**Table 3-19.**
**AADT Summary at the Proposed Project**

| Location | AADT |
|---|---|
| I-15, 1.5 Mile North of Apex Interchange SR-604 (Exit 58) | 28,424[1] |
| I-15, 3.2 Mile North of US-93 (Exit 64) | 23,786[1] |
| I-15, between Valley of Fire (Exit 75) and UTE Interchange (Exit 80) | 17,629[1] |
| US-93, 0.6 Mile West of I-15 Interchange (Exit 64) | 2,131[1] |
| Valley of Fire, 4.8 Mile East of I-15 Interchange (Exit 75) | 398[1] |
| UTE, (Exit 80) | No Data Available |
| North Las Vegas Boulevard | 317[a] |
| US-93 Northbound Off-Ramp at I-15 (Exit 64) | 2,203[1] |
| US-93 Northbound On-Ramp at I-15 (Exit 64) | 226[1] |
| US-93 Southbound Off-Ramp at I-15 (Exit 64) | 245[1] |
| US-93 Southbound On-Ramp at I-15 (Exit 64) | 2,186[1] |

**Table 3-19 Continued**

| Location | AADT |
|---|---|
| Valley of Fire Highway Northbound Off-Ramp at I-15 (Exit 75) | 975[1] |
| Valley of Fire Highway Northbound On-Ramp at I-15 (Exit 75) | 819[1] |
| Valley of Fire Highway Southbound Off-Ramp at I-15 (Exit 75) | No Data Available |
| Valley of Fire Highway Southbound On-Ramp at I-15 (Exit 75) | 740[1] |
| UTE Northbound Off-Ramp at I-15 (Exit 80) | 50[2] |
| UTE Northbound On-Ramp at I-15 (Exit 80) | 50[2] |
| UTE Southbound Off-Ramp at I-15 (Exit 80) | 30[2] |
| UTE Southbound On-Ramp at I-15 (Exit 80) | 30[2] |

Source: [1] NDOT 2010 Annual Traffic Report, [2] NDOT 2009 Annual Traffic Report

Notes:
a Estimated AADT based on the NDOT 2010 traffic data for adjacent roadways

A capacity analysis is the primary method of evaluating the quality of service of highway and street facilities. The Highway Capacity Manual 2000 (Transportation Research Board 2000), published by the Transportation Research Board, outlines capacity analysis procedures and criteria for defining Level of Service (LOS). LOS is defined as a qualitative measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience (Traffic Research Board 2005). LOS indicators for the highway and roadway system are based on specific characteristics of traffic flow on designated sections of roadway during a typical day. For mainline freeway and roadway segments, these include overall traffic volume, speed, and density. Several physical and operational characteristics of the roadway, such as lane configuration, free-flow speed (typical speed between intersections), and number of intersections per mile, are used to determine the vehicular capacity of the roadway segment. When these two sets of data are compared, a volume to capacity (V/C) ratio is calculated. These factors are then converted to a letter classification identifying best to worst operating conditions, expressed as levels of service ranked A through F as defined in Table 3-20. For intersections, LOS can be determined by using either the methodology described above or by using the average control delay (the amount of time a vehicle is delayed by the operations of the traffic control) calculated at an individual intersection (Traffic Research Board 2005).

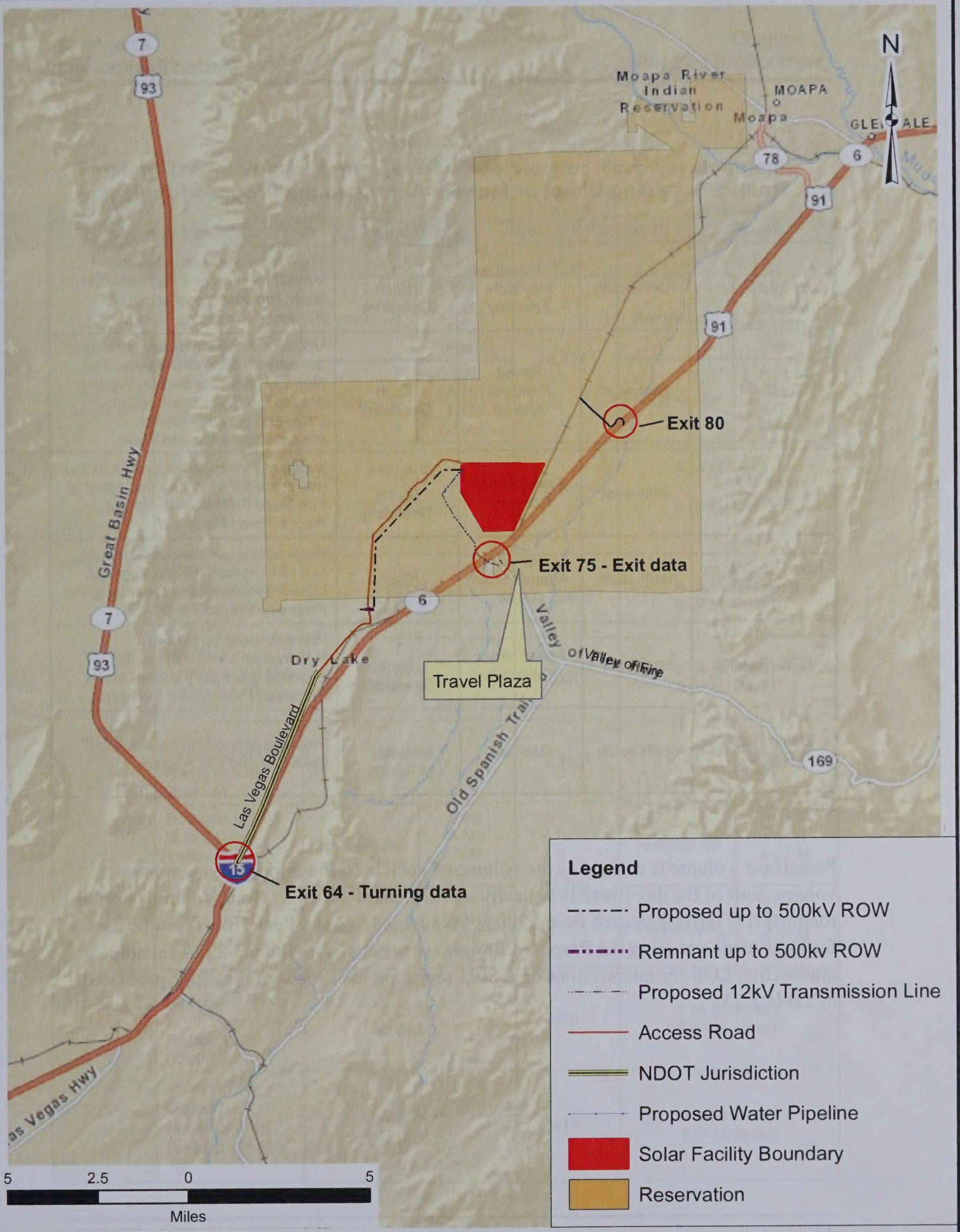
### Table 3-20.
### Level of Service Classifications and Definitions

| LOS Class | Definition |
|---|---|
| A | Free flow of traffic. Individual users are virtually unaffected by others in the traffic stream. Level of comfort and convenience is excellent. |
| B | Within the range of stable traffic flow, with the presence of others in the traffic stream beginning to be noticeable. Level of comfort and convenience is below LOS A, as the presence of others in the traffic stream begins to affect individual behavior. |
| C | Within the range of stable traffic flow, but marks the point at which the operation of individual users is significantly affected by others in the traffic stream. Level of comfort and convenience declines noticeably. |
| D | High-density, but stable traffic flow. Speed and freedom to maneuver are severely restricted and the level of comfort and convenience is generally poor. At this level, small additions of traffic are likely to cause operational problems. |
| E | Operating conditions at or near the capacity level with all speeds being reduced to a low, but uniform value. Freedom to maneuver with the traffic stream is extremely difficult and comfort and convenience are extremely poor, leading to high driver frustration. |
| F | Forced or breakdown traffic flow. Exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. |

Source: Martin & Martin 2001

### 3.11.6.2. Major Traffic Routes Within or Adjacent to the Proposed Project

The Proposed Project is located in a largely undeveloped area and, therefore, major transportation routes are limited. I-15 would provide direct access to the Proposed Project from the urban centers of Southern Nevada, such as Las Vegas from the south, and Salt Lake City, Utah from the north (Figure 3-12). US-93 provides east-west direct access from I-15 and North Las Vegas Boulevard, as shown in Table 3-21.



N
Moapa River Indian Reservation
MOAPA
Moapa
GLENDALE
7
93
78
6
91
91
Exit 80
Great Basin Hwy
Exit 75 - Exit data
6
7
93
Valley of Fire
Valley of Fire
Dry Lake
Travel Plaza
Las Vegas Boulevard
Old Spanish Trail
169
15
Exit 64 - Turning data
Las Vegas Hwy
5
2.5
0
5
Miles
Legend
Proposed up to 500kV ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Access Road
NDOT Jurisdiction
Proposed Water Pipeline
Solar Facility Boundary
Reservation

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Project

Moapa River Indian Reservation

Traffic Data Analysis Map

MALCOLM PIRNIE, INC.

February 2012

FIGURE 3-12

### Table 3-21.
### Routes Providing Direct or Indirect Access to the Proposed Project

| Route | Direction | Type | Lanes | Description |
|---|---|---|---|---|
| I-15 | north-south | Paved Interstate Freeway | 2 (Each Direction) | Provides a connection between Las Vegas, Nevada and Salt Lake City, Utah. Provides direct access to Proposed Project via US-93. |
| US-93 | east-west | Paved Principal Arterial | 1 (Each Direction) | US 93 is a major highway traversing the eastern edge of the state. The highway connects the Las Vegas area to the Great Basin National Park, and provides further connections to Ely and Wells. |
| Valley of Fire Highway | east-west | Paved Minor Collector | 1 (Each Direction) | Valley of Fire Highway serves as the major access point into the Valley of Fire State Park and the Moapa Paiute Travel Plaza. |
| North Las Vegas Boulevard | north-south | Paved Arterial/ State Route | 1 (Each Direction) | Runs parallel, at various distances, to I-15 from north of Las Vegas to US-93. Provides direct access to the Proposed Project via US-93. |
| UTE (Exit 80) | east-west | Paved Minor Collector | 1 (Each Direction) | Primarily used by Moapa Reservation turnaround traffic. Provides secondary access to the Proposed Project from the north. |
| Union Pacific Railroad | north-south | Railroad | 1 track | Provides connection between Salt Lake City and Los Angeles. |

Source: Clark County 2008

Peak Hour Volume is defined as the volume of vehicle traffic during the maximum-volume hour of the day (there is typically an A.M. and P.M. Peak Hour Volume on most roadways) (Traffic Research Board 2005). Available LOS and Peak Hour Volume data for local roads servicing the Proposed Project are presented in Table 3-22. Available intersection LOS for intersections on US-93 servicing the Proposed Project is presented in Table 3-23.

## Table 3-22.
## Existing Traffic Volumes and Levels of Service for Roadway Segments

| Route | Segment | Peak Hour Volume [a] | | Annual Average Daily Traffic [b] | Level of Service | |
|---|---|---|---|---|---|---|
| I-15 | Between APEX (Exit 58) and US-93 (Exit 64) | Northbound | 936 (A.M.)[1]<br>1,038 (P.M.)[1] | 28,424[1] | Northbound | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |
| | | Southbound | 697 (A.M.)[1]<br>1,133 (P.M.)[1] | | Southbound | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |
| | US-93 Northbound Off-Ramp at I-15 (Exit 64) | 240 (A.M.)[4]<br>120 (P.M.)[4] | | 2,203[1] | A (A.M. Peak)[3]<br>B (P.M. Peak)[3] | |
| | US-93 Northbound On-Ramp at I-15 (Exit 64) | 42 (A.M.)[4]<br>58 (P.M.)[4] | | 226[1] | A (A.M. Peak)[3]<br>B (P.M. Peak)[3] | |
| | US-93 Southbound Off-Ramp at I-15 (Exit 64) | 44 (A.M.)[4]<br>54 (P.M.)[4] | | 245[1] | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] | |
| | US-93 Southbound On-Ramp at I-15 (Exit 64) | 106 (A.M.)[4]<br>230 (P.M.)[4] | | 2,186[1] | A (A.M. Peak)[3]<br>B (P.M. Peak)[3] | |
| | Between US-93 (Exit 64) and Valley of Fire (Exit 75) | Northbound | 789 (A.M.)[1]<br>896 (P.M.)[1] | 23,786[1] | Northbound | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |
| | | Southbound | 641 (A.M.)[1]<br>818 (P.M.)[1] | | Southbound | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |
| | Valley of Fire Highway Northbound Off-Ramp at I-15 (Exit 75) | 35 (A.M.)[1]<br>68 (P.M.)[1] | | 975[1] | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] | |
| | Valley of Fire Highway Northbound On-Ramp at I-15 (Exit 75) | 47 (A.M.)[1]<br>48 (P.M.)[1] | | 819[1] | A (A.M. Peak)[3]<br>B (P.M. Peak)[3] | |

## Table 3-22 Continued

| Route | Segment | Peak Hour Volume [a] | | Annual Average Daily Traffic [b] | Level of Service | |
|---|---|---|---|---|---|---|
| | Valley of Fire Highway Southbound Off-Ramp at I-15 (Exit 75) | No Data Available | | No Data Available | No Data Available | |
| | Valley of Fire Highway Southbound On-Ramp at I-15 (Exit 75) | 35 (A.M.)[1]<br>60 (P.M.)[1] | | 740[1] | A (A.M. Peak)[3]<br>B (P.M. Peak)[3] | |
| | Between Valley of Fire (Exit 75) and UTE (Exit 80) | Northbound | 528 (A.M.)[1]<br>800 (P.M.)[1] | 17,629[1] | Northbound | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |
| | | Southbound | 533 (A.M.)[1]<br>523 (P.M.)[1] | | Southbound | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |
| | UTE Northbound Off-Ramp at I-15 (Exit 80) | No Data Available | | 50[2] | No Data Available | |
| | UTE Northbound On-Ramp at I-15 (Exit 80) | No Data Available | | 50[2] | No Data Available | |
| | UTE Southbound Off-Ramp at I-15 (Exit 80) | No Data Available | | 30[2] | No Data Available | |
| | UTE Southbound On-Ramp at I-15 (Exit 80) | No Data Available | | 30[2] | No Data Available | |
| US-93 | West of North Las Vegas Boulevard | 254 (A.M.)[4]<br>240 (P.M.)[4] | | 2,131[1] | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] | |

## Table 3-22 Continued

| Route | Segment | Peak Hour Volume [a] | Annual Average Daily Traffic [b] | Level of Service |
|---|---|---|---|---|
| Valley of Fire | East of I-15 Interchange (Exit 75) | 29 (A.M.)[1]<br>27 (P.M.)[1] | 398[1] | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |
| UTE | UTE, (Exit 80) | No Data Available | No Data Available | No Data Available |
| North Las Vegas Boulevard | North of US-93 | 140 (A.M.)[4]<br>190 (P.M.)[4] | 317[c] | A (A.M. Peak)[3]<br>A (P.M. Peak)[3] |

Source: [1] NDOT 2010, [2] NDOT 2009, [3] Transportation Research Board 2000, [4] Traffic Counts Collected in 2011

Notes:

a Volume of vehicle traffic during the maximum-volume hour of the day

b Total volume of vehicle traffic for a year divided by 365 days(from NDOT 20010 Annual Traffic Report)

c Estimated based on the NDOT 2010 traffic data for adjacent roadways

## Table 3-23.
## Intersection Levels of Service

| Intersection | Level of Service |
|---|---|
| US-93 at I-15 Northbound Ramps | |
| Eastbound Left | A (A.M. Peak)[1]<br>A (P.M. Peak)[1] |
| Northbound Approach | B (A.M. Peak)[1]<br>B (P.M. Peak)[1] |
| US-93 at I-15 Southbound Ramps | |
| Westbound Left | A (A.M. Peak)[1]<br>A (P.M. Peak)[1] |
| Southbound Approach | B (A.M. Peak)[1]<br>B (P.M. Peak)[1] |
| | |

**Table 3-23 Continued**

| Intersection | Level of Service |
|---|---|
| US-93 at I-15 Southbound Ramps | |
| Eastbound Left | A (A.M. Peak)[1]<br>A (P.M. Peak)[1] |
| Westbound Left | A (A.M. Peak)[1]<br>A (P.M. Peak)[1] |
| Northbound Approach | B (A.M. Peak)[1]<br>B (P.M. Peak)[1] |
| Southbound Approach | B (A.M. Peak)[1]<br>B (P.M. Peak)[1] |

Source: [1] Transportation Research Board 2000

## 3.12. Special Management Areas

Managed natural areas in the vicinity include Valley of Fire State Park, located 7 miles southeast of the Proposed Project. The 106-acre Moapa Valley National Wildlife Refuge, established to protect the thermal spring habitat of the Moapa Dace, is located 7 miles northwest of the Proposed Project. Inventories for LWCs were conducted by the BLM and resulted in findings adjacent to Arrow Canyon Wilderness and the Muddy Mountains Wilderness. There are no LWCs within the Proposed Project area.

### 3.12.1. Wilderness

Wilderness is a legal designation designed to provide long-term protection and conservation of federal public lands. Wilderness is defined by the Wilderness Act of 1964 as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." The closest wilderness areas are Arrow Canyon Wilderness (designated in 2002) located 10-13 miles west of the Proposed Project, the Muddy Mountains Wilderness located 12 miles south of the Proposed Project, and the Meadow Valley Range Wilderness and Mormon Mountain Wilderness Areas (designated in 2004) located approximately 16 miles north of the Proposed Project.

Areas of Critical Environmental Concern (ACECs) are areas designated by BLM where special management attention is needed to protect and prevent irreparable damage to unique natural values, or to protect human life and safety from natural hazards. Natural values include, but are not limited to, historic, cultural, scenic, and wildlife resources. The southern boundary of the 151,360-acre Mormon Mesa ACEC is located 7.5 miles northeast and 9 miles north of the Proposed Project. The Coyote Springs ACEC is located 19 miles to the west, and the Gold Butte ACEC is located 18 miles to the east. All three ACECs were established specifically for the management of desert tortoise habitat and recovery of the desert tortoise (BLM 1998).

### 3.12.2. Recreation

This section discusses recreational resources within 5 miles of the Proposed Project. A 5-mile buffer has been chosen primarily due to visual assessments and because it may include direct, on-site impacts to recreation, as well as reasonably foreseeable off-site impacts to recreational areas and dispersed recreational activities.

The Proposed Project would be constructed entirely on lands owned by the Tribe. No recreation areas or dispersed recreational opportunities were identified within 5-miles of the Proposed Project.

## 3.13. Visual Resources

This section identifies existing visual resources within and adjacent to the Proposed Project and discusses applicable regulations. The baseline visual setting was developed based on the BLM guidelines for visual resource management (VRM) with input from members of the public during the scoping process. The BLM's VRM system provides a framework for describing visual resources, establishing appropriate management goals for those resources, assessing the impact of an action on those resources, and determining whether such an action would conflict with established management goals. Visual resources for the Proposed Project area are described in two ways in this section. The Visual Resources Inventory (VRI) which was predetermined using adjacent BLM land ratings and the VRM subsection that describes the visual resource management planning process and takes into consideration, among other factors, the visual resources inventory.

It should be noted that neither the Tribe nor the BIA have a visual resource management policy for tribal lands. The BLM visual resource management guidelines are being applied to the Proposed Project lands for consistency of NEPA analysis purposes only and that the VRM assessment and mitigation are for the Proposed Project only and in no way applies a formal, permanent VRM classification of any land managed or owned by the BIA or Tribe, respectively.

The analysis of impacts to visual resources, including the existing visual resources as documented in the VRM goals established for the Proposed Project, is included in Section 4.14 of this document. This analysis involves measuring the degree of contrast that would be introduced by the Proposed Project from Key Observation Points (KOPs). These KOPs are introduced and described in Section 3.13.1.5.

The Proposed Project is located approximately 0.25 miles west of I-15. The terrain rises rapidly from I-15 to the mesa on which the Proposed Project is located. The terrain is relatively flat in some places while other areas exhibit large drainages and topographic relief. The land to the north of the Proposed Project is within the Reservation and is approximately 50 feet lower in elevation than the mesa. Vegetation is predominantly low, widely spaced shrubs characteristic of the Mohave Desert. The Arroyo Canyon Range Mountains are visible in the background beyond the Proposed Project from I-15. The dominant man-made visual feature from portions I-15 will be the solar panels. Other features of the solar facility will not be easily discernible due to the terrain and the distance from the interstate. Other man-made features in the Proposed Project viewshed include fences and up to six power lines ranging from 230kV to 500kV in size. The existing utility corridor that traverses the Proposed Project from the southwest to the northeast is approximately 4,000-foot wide.

### 3.13.1. Visual Resources Inventory

Visual Resource Inventory of adjacent BLM lands to the Proposed Project was completed by the BLM using the BLM Manual H-8410-1. Due to no applicability of BLM protocol on tribal lands to ascertain VRI, the VRM study was completed using the adjacent BLM land classes. For the purpose of this analysis, all land west of I-15 utilized as the Proposed Project has been assigned visual resource Class IV.

#### 3.13.1.1. Visual Resource Contrast Rating and Management Classes

As stated in the BLM Manual H-8410-1, the visual resource classes are categories assigned to public lands that serve two analysis purposes: (1) an inventory tool that portrays the relative value of the visual resources, and (2) a management tool that portrays the visual management objectives. Ultimately, one of four VRM classes, (I, II, III, IV) is assigned to the area with the status of 'I' illustrating the most valuable of visual resources and 'IV' being the least.

- **Class I Objective**. The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **Class II Objective**. The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low.

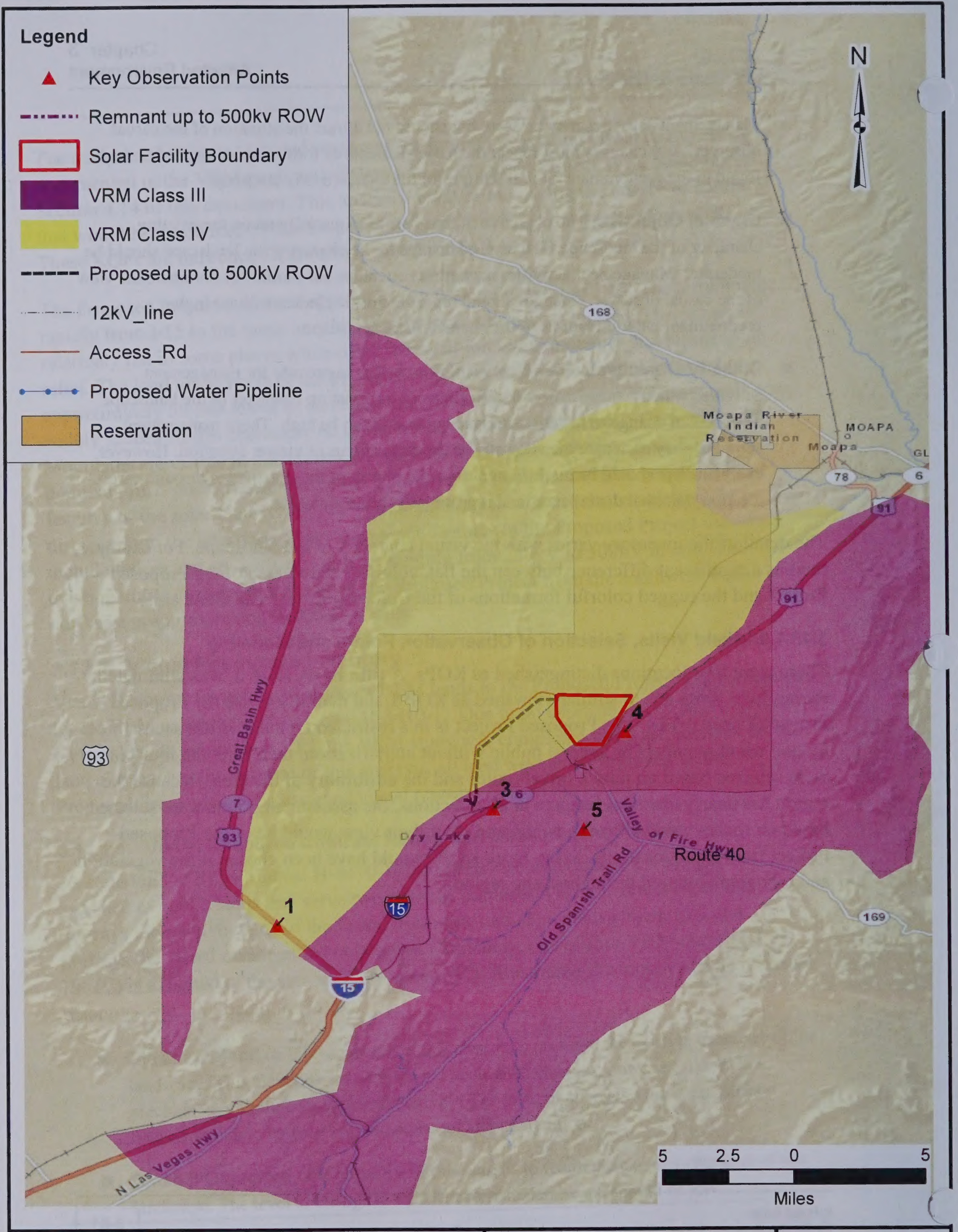
Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- **Class III Objective**. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **Class IV Objectives**. The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The detail of the inventory varies with the visual character of the landscape. For example, there is a significant difference between the flat, colorless desert area of the Proposed Project and the rugged colorful formations of the Colorado River / Big Bend area.

### 3.13.1.2. Field Visits, Selection of Observation Points and Modeling

There were four locations distinguished as KOPs. A fifth KOP, KOP 2, was eliminated during field visits due to similar viewshed as KOP 1 and inability to see the Proposed Project (Figure 3-13). The Proposed Project is in a restricted area that is not accessible by non-tribal members or general public without authorization; therefore, the four points were selected based on public travel routes and the uniformity of the area. Because the region has nearly identical features in all directions, the assessment points were selected based on routes traveled by the public and what their view would be of the Proposed Project from those locations. Many more KOPs would have been chosen if the vegetation and topography varied throughout the region.


Legend
▲ Key Observation Points
Remnant up to 500kv ROW
Solar Facility Boundary
VRM Class III
VRM Class IV
Proposed up to 500kV ROW
12kV_line
Access_Rd
Proposed Water Pipeline
Reservation
N
168
Moapa River Indian Reservation
MOAPA
Moapa
GL
78
6
91
91
Great Basin Hwy
93
7
93
6
1
3
4
5
Dry Lake
Valley of Fire Hwy
Route 40
Old Spanish Trail Rd
15
15
169
N Las Vegas Hwy
5 2.5 0 5
Miles

MALCOLM PIRNIE

KRoad Power
San Diego, California

KRoad Moapa Solar Facility

Moapa Reservation

Moapa Town, Nevada
Visual Resource
Management Classes

MALCOLM PIRNIE, INC.

February 2012
FIGURE 3-13

Map Document:Austin/6923001/GIS/MXD/BA Figure 2-2

### 3.13.1.3. Visual Contrast Rating

The Proposed Project and the surrounding areas all fall into categories IV, meaning that the areas are of moderate to least visual aesthetic value. Contrast ratings from each KOP can be seen in Table 3-24. The Proposed Project is not seen from KOPs 1 and 3.

Table 3-24.
Visual Contrast Rating

**KOP 4**

| Degree of Contrast | | Land/Water Body | Vegetation | Structures |
|---|---|---|---|---|
| Elements | Form | Moderate | Strong | Weak |
| | Line | Weak | Weak | Weak |
| | Color | Moderate | Strong | Strong |
| | Texture | Moderate | Strong | Moderate |

**KOP 5**

| Degree of Contrast | | Land/Water Body | Vegetation | Structures |
|---|---|---|---|---|
| Elements | Form | Weak | None | Weak |
| | Line | Weak | None | Weak |
| | Color | Weak | Weak | Weak |
| | Texture | Moderate | Weak | Moderate |

### 3.13.1.4. Key Observation Points

The BLM methodology for assessing impacts on visual resources (BLM Manual 8431) analyzes the level of contrast that would be introduced by the Proposed Project through a comparison of existing and simulated visual conditions from select KOPs. Key Observation Points include both sensitive and typical views of the Proposed Project. Due to the various mesas and topographical nature of the Proposed Project (on a mesa within a valley) the solar facility site and infrastructure is not seen from the northbound approach on I-15, cannot be seen from highway 93, and is only intermittently seen from the southbound approach on I-15 with an assumed speed of 75mph. The Proposed Project is mostly visible from Route 40 starting approximately 2 miles east of I-15 to a point approximately 8 miles east of I-15 prior to entering the Valley of Fire.

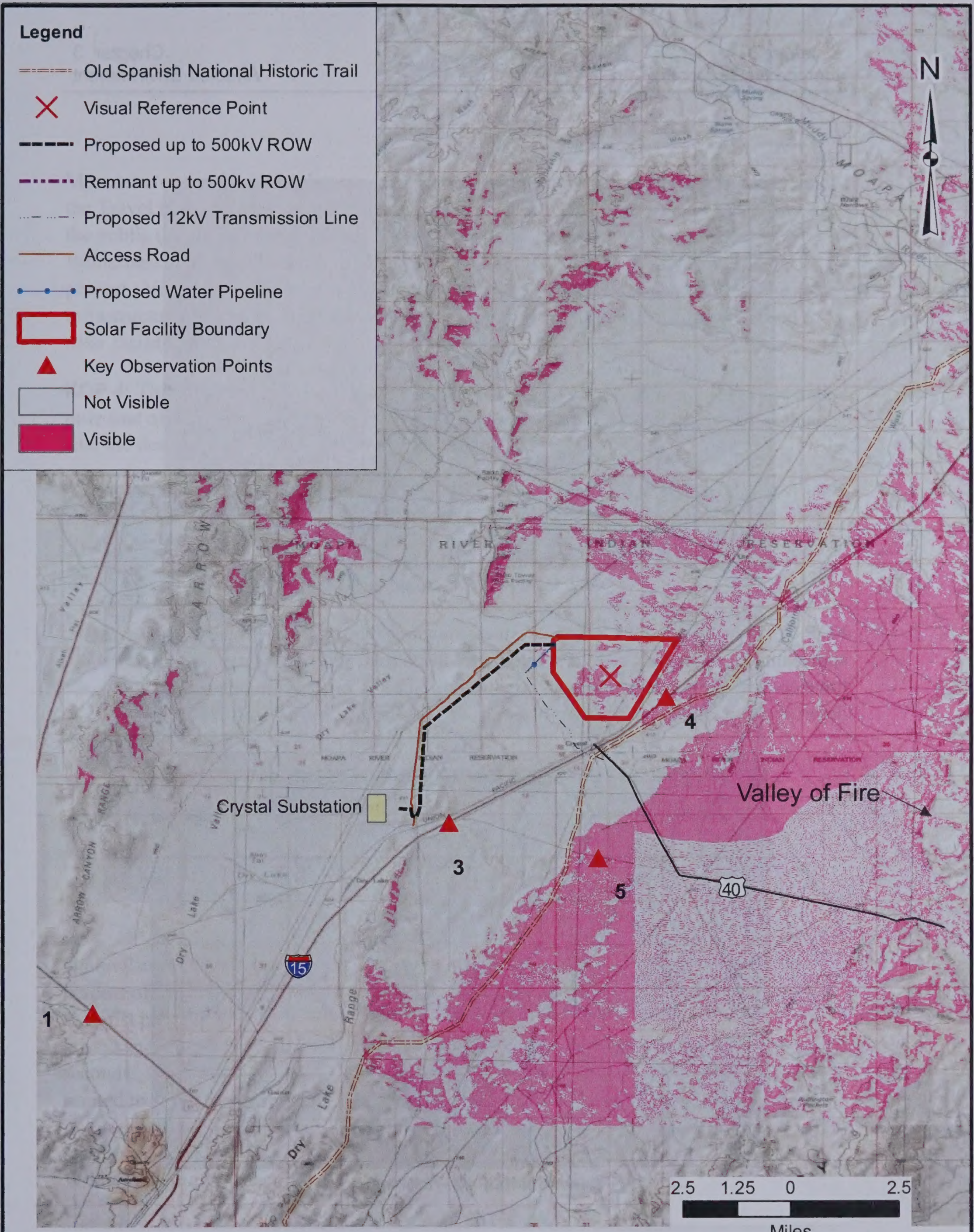
Prior to conducting field work, the Proposed Project features were plotted on Digital Elevation Models (DEMs) using ArcGIS 3-D analyst. These maps were overlain with the locations of communities, travel routes, preservation areas, historic landmarks, and recreation areas (for example, parks, historic trails, and OHV trails). A viewshed analysis was then conducted to determine the areas from which Proposed Project solar facility (solar modules 7’6” in height) could be visible from any location with a 6-foot viewing height. The analysis extended in a 15 mile radius of the Proposed Project to analyze potential visibility from KOPs (Figure 3-14). This represents a conservative approach to capture all sensitive viewpoints from which the Proposed Project would be visible. The study assumed that view of the proposed transmission line would be less likely as compared to the solar field due to placement within the existing transmission line utility corridor and the ‘blending’ affect that would result with distance and similar background. The utility corridor is also at a lower elevation than the solar field and therefore less visible to the surrounding viewshed.

Analysis of these sites relative to the Proposed Project area allowed a preliminary assessment of visual impacts associated with the Proposed Project. The BLM’s Las Vegas Field Office reviewed and approved the viewshed analysis during the field inventory. Critical viewpoints, including commonly traveled routes or other likely viewpoints, were selected based on the viewshed analysis, which considered the angle of observation, number of viewers, length of time the project is in view, relative project size, season of use, and light conditions.

### 3.13.1.5. Description of KOPs and their Viewshed

**KOP 1:** This site is on Highway 93, three miles north of I-15. The view is looking northeast towards the Proposed Project. This road is one of the main routes in the area, but is less traveled than I-15 and has a posted speed limit of 70mph. From this site, five transmission lines and many towers are visible in the foreground and middleground as well as a powerplant and substation in the middleground. The flat mountain ranges are in the distance. The vegetation is creosote/scrub desert displaying colors of browns, tans and yellows.

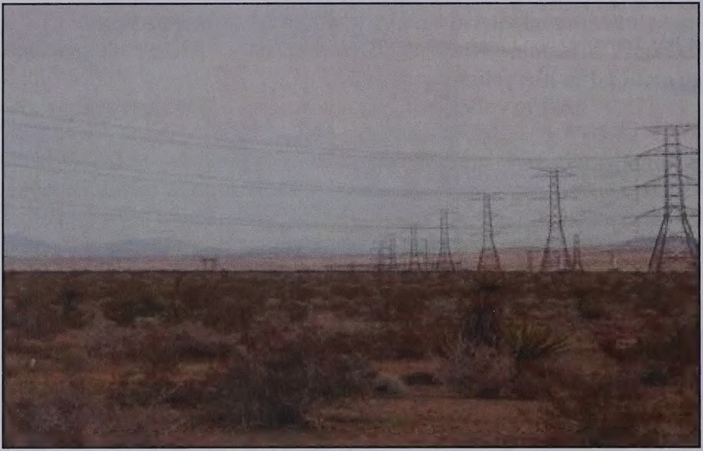
The area may be described as industrial. The area is not used as a Nature Area, Wilderness Area or Wilderness Study Area, nor are there any Wild or Scenic Rivers present. The Proposed Project is not visible from this location. The VRM classification for this area is VRM Class IV.


Legend
Old Spanish National Historic Trail
Visual Reference Point
Proposed up to 500kV ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Access Road
Proposed Water Pipeline
Solar Facility Boundary
Key Observation Points
Not Visible
Visible
N
MOAPA
MOAPA RIVER INDIAN RESERVATION
ARROW
Valley
Dry Lake Valley
Crystal Substation
Valley of Fire
1
3
4
5
15
40
ARROW CANYON RANGE
Dry Lake
Range
Dry
Lake
2.5 1.25 0 2.5
Miles

Source: 10-meter DEM / USGS 7.5 minute Quads

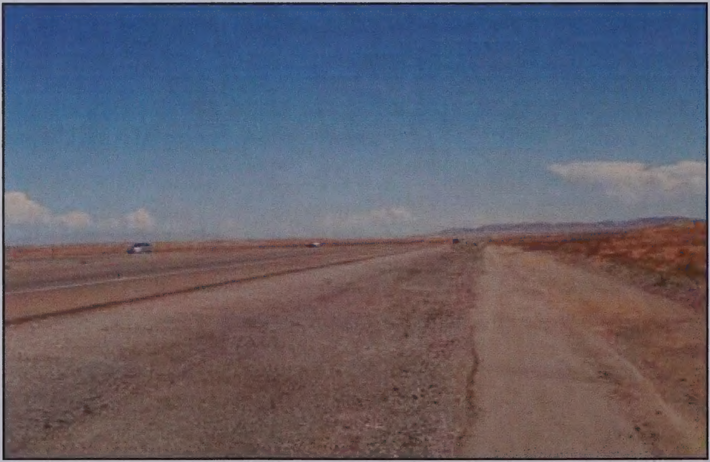
| MALCOLM PIRNIE | KRoad Power<br>San Diego, California<br>KRoad Moapa Solar Facility | Moapa Reservation<br>Moapa Town, Nevada<br>Viewshed Analysis | MALCOLM PIRNIE, INC.<br>February 2012<br>FIGURE 3-14 |
|---|---|---|---|

Map Document:Austin/6923001/GIS/MXD/BA Figure 2-2



View from KOP #1 – looking North

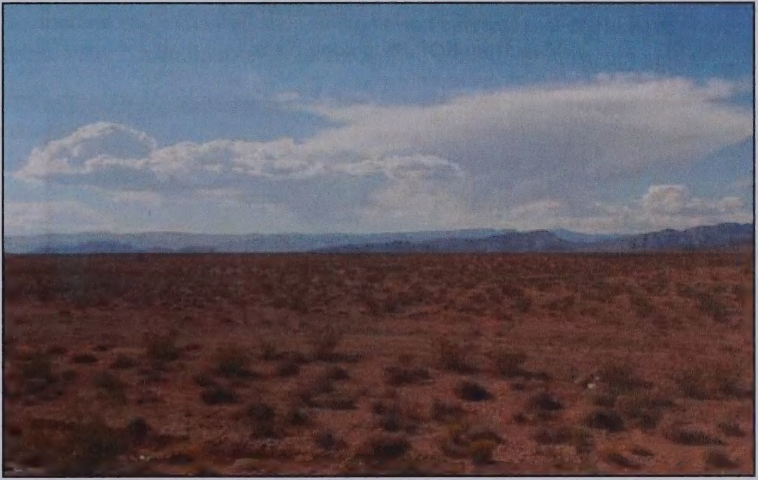
**KOP 3:** This site is on I-15 looking northeast towards the Proposed Project, approximately three miles south of the Travel Plaza (exit 75). This is a main route for travelers in this region and has a posted speed limit of 75 mph. From this site, sparse desert scrub is visible with displays of red and yellow and exposed soil throughout.



View from KOP #3 – looking North

Mountains are in the far background. A Transmission line adjacent to I-15 is in view and the Travel Plaza is at the far middleground. There is a low amount of land use, if any, by the public (no parks or recreational areas). The area is not used as a Nature Area, Wilderness Area or Wilderness Study Area, nor are there any Wild or Scenic Rivers present. Visibility of the Proposed Project sight starts one mile prior to exit 75. The solar infrastructure may be visible if placed near or at the edge of the mesa at the proposed solar facility boundary.

**KOP 4:** This site is on I-15 looking west at the Proposed Project, approximately one half mile east of the solar facility. This is a main route for travelers in this region. From this site, the desert landscape is in full view with the divided interstate. The Union Pacific Rail Road and railroad spur with railcars are visible. Approximately 70 percent of the solar facility could be seen from this location during a brief moment as motorist pass between side-road hills or mounds traveling at an assumed 75mph. At the posted speed limit it is assumed that the solar facility is in view for approximately 3-5 seconds. Mountains are seen in the background. The vegetation near the highway is limited to sparse creosote. Colors present are tan, grey, olive and slate. The landform is flat to the mesa. There is a low amount of land use, if any, by the public (no parks or recreational areas). The area is not used as a Nature Area, Wilderness Area or Wilderness Study Area, nor are there any Wild or Scenic Rivers present.



**View from KOP #4 – looking Southwest**

**KOP 5:** This site is just southwest of Route 40 looking north towards the Proposed Project, approximately three miles south of the solar facility and viewed from the historic Old Spanish Trail. Route 40 is not a major route and this part of the Old Spanish Trail is assumed to be infrequently visited by the public. From this site, the desert landscape is flat and is primarily creosote. There are no structures in the foreground and the mountains are in the background. There are transmission lines and I-15 in the background with 18-wheeled trucks in view at the Travel Plaza. The Travel Plaza is in the middleground. Route 40 has a lower traffic volume than 1-15, and the interstate is visible from the site. The area is not used as a Nature Area, Wilderness Area or Wilderness Study Area, nor are there any Wild or Scenic Rivers present; however, Route 40 does terminate at the Valley of Fire State Park. The Proposed Project is visible from 3-8 miles east of I-15 traveling west; however, elevation of the mesa would cause one to lose view of the Proposed Project once nearing the Travel Plaza. The Proposed Project is not visible from the Valley of Fire State Park.

**View from KOP #5 looking north**

## 3.14. Public Health and Safety

This section defines existing conditions relative to human health and safety/hazardous materials to establish a baseline against which potential impacts may be measured. The Proposed Project is located on undeveloped lands held in trust for the Tribe and would be potentially affected by existing hazards near the Proposed Project, including fire, earthquakes, flooding, and existing soil or groundwater contamination. Other potential natural hazards, hazards related to existing infrastructure, and hazards associated with uses of the site and its vicinity are considered in this section.

### 3.14.1. Potential Hazardous Waste/Contaminated Soil and Groundwater

Exposure to hazardous materials or wastes can occur from both existing conditions at the Proposed Project and from Proposed Project activities. The potential for encountering hazards and hazardous material at the Proposed Project during construction and operation are considered very unlikely.  Example of past and current land uses that could have resulted in unknown contamination include:

- Farms that contain old or inactive underground storage tanks (USTs);
- Pesticide-polluted runoff from agricultural properties; and
- Commercial and industrial sites (historic and current) that could have soil or groundwater contamination from unreported hazardous substance spills.

An Environmental Hazardous Radius Report was obtained through GeoSearch (Appendix N) to determine if historical or current hazardous material may be present at the Proposed Project.  The Report concluded that three potential sites within 0.25 and 0.50 miles from the Proposed Project contained underground storage tanks or leaking underground storage tanks.  All sites were confirmed to not be adjacent to the site, cleaned and closed or permanently out of use. There is no reported hazardous site within the Proposed Project site.

### 3.14.2. Construction

#### Hazardous Materials Management

Fuels, oils, lubricants, and solvents would be the primary hazardous and flammable materials that would be on-site during construction and operation; these substances would be required for the operation of construction equipment. Potential effects related to breakage of the PV panels are discussed under operations. Small quantities of additional common hazardous materials would be used on-site during construction, including antifreeze and used coolant, latex and oil-based paint, paint thinners and other solvents, cleaning products, and herbicides. Also during substation construction, transformer oil would be transported to the site for use in the main step-up transformers in the substation. Substation transformers typically contain moderate quantities of oil. Table 3-25 provides a list of the typical chemical, use, storage location and storage quantity that will be on-site.

### Table 3-25.
### Hazardous Materials Used and Stored During Construction

| Material | Purpose | Storage Location | Maximum Stored | Storage Type |
|---|---|---|---|---|
| Diesel fuel | Refueling construction vehicles and equipment | Equipment Service Area | 5,000 gallons | Tank |
| Diesel fuel | Refueling truck | Equipment Service Area/mobile | 1,000 gallons | Truck |
| Gasoline | Refueling construction vehicles and equipment | Equipment Service Area | 1,000 gallons | Tank |
| Gasoline | Refueling truck | Equipment Service Area/mobile | 1,000 gallons | Truck |
| Lubricating oil | Lubricating equipment parts | Equipment Service Area | 250 gallons | Tanks |
| Hydraulic oil | Lubricating equipment parts | Equipment Service Area | 55 gallons | Tanks |
| Grease | Lubricating equipment parts | Equipment Service Area | 45 gallons | Drum |
| Transformer Oil | Coolant | Equipment Service Area | 1,000 gallons | Tanks |
| Acetylene | Welding | Equipment Service Area | 500 cubic feet | Cylinders |
| Oxygen | Welding | Equipment Service Area | 500 cubic feet | Cylinders |
| Cleaning chemicals/ detergents | Periodic cleaning | Equipment Service Area | 150 gallons | Drums or small containers |

Notes:

All chemical containers will be stored in a designated location adjacent to the main service building on appropriate secondary containment pads.

All gas cylinders will be stored in standard steel bottles and sorted and secured in a designated location adjacent to the main service building.

All Hazardous waste will be segregated, sorted, and stored in a designated location separate from the "virgin" chemical storage location.

Any large quantities of hazardous materials used during Proposed Project construction would be transported by a licensed transporter and would be subject to applicable laws and regulations pertaining to the transport of hazardous materials, including proper signage on tankers, potential limits on vehicle speeds, and regulations such as stopping at all railroad crossings. In addition, hazardous materials would only be transported during daylight hours, which would avoid any visibility impacts associated with nighttime driving.

**Worker Safety**

During Proposed Project construction, standard health and safety procedures would be implemented in accordance with OSHA standards to minimize the risk of accidents or injuries. Safety planning and regular training sessions would occur to ensure that workers were adequately prepared to address any anticipated site-specific hazards, such as electrocution, fires, and accidents (such as slips, trips, or falls). In addition, workers would be trained on the appropriate use of safety equipment and personal protective equipment (PPE). The EPC contractor will be responsible for submitting an adequate Health & Safety Plan prior to construction.

## 3.14.3. Operations

### Hazardous Materials Management

During operations and maintenance, small quantities of hazardous materials would be periodically and routinely transported, used, and disposed of off-site. These materials would consist primarily of minor amounts of petroleum products (fuels and lubricating oils) and a small to moderate amount of motor vehicle fuel. Small quantities of additional common hazardous materials would be used on site, including antifreeze and used coolant, latex and oil-based paint, paint thinners and other solvents, cleaning products, and herbicides. Table 3-26 provides a list of the typical chemical, use, storage location and storage quantity that will be on-site.

**Table 3-26.**
**Hazardous Materials Used and Stored During Operation**

| Chemical | Use | Storage Location/Type | State | Storage Quantity |
|---|---|---|---|---|
| Insulating oil | Electrical equipment | Electrical equipment (contained in transformers and electrical switches) | Liquid | 25,000 gallons initial fill<br>250 gallons for storage during operation. |
| Lubricating oil | Misc. PV module parts | 55-gallon drums | Liquid | (4) 55-gallon drums |
| Miscellaneous scale inhibitors & algae control chemicals | Corrosion & biological build-up of Reverse Osmosis equipment & pipes | Wastewater Treatment Area | Liquid | Four (4) 55-gallon drums |
| Acetylene | Welding | Cylinders stored in maintenance buildings | Gas | 100 cubic feet |

Table 3-26 Continued

| Chemical | Use | Storage Location/Type | State | Storage Quantity |
|---|---|---|---|---|
| Oxygen | Welding | Cylinders stored in maintenance buildings | Gas | 1,00 cubic feet |
| Gasoline | Maintenance vehicles | Double walled, ventilated tank | Liquid | 5,000 gallons |
| Diesel fuel | Firewater pump<br>Maintenance Vehicles | Double walled, ventilated tank | Liquid | 5,000 gallons |

Notes:

All chemical containers will be stored in a designated location adjacent to the main service building on appropriate secondary containment pads.

All gas cylinders will be stored in standard steel bottles and sorted and secured in a designated location adjacent to the main service building.

All Hazardous waste will be segregated, sorted, and stored in a designated location separate from the "virgin" chemical storage location.

All transformers would comply with SPCC requirements, which mandate that transformers be placed in such a way that a release of the entire volume of oil in a transformer would not discharge into surface water and would be promptly cleaned up. The SPCC plans will conform to the facility SWPPP and adhere to spill response and prevention measures for impacts to stormwater receptacles. Adequate supplies of spill response materials (i.e., absorbents and drums) will be stored in a designated area within the maintenance area.

All hazardous waste will be stored in a designated location and separated from other non-hazardous waste containers. Properly sized secondary spill containments will be provided for each type of waste. Each secondary spill containment structure will be sized to accommodate 110 percent of the volume of the largest container. Incompatible chemicals will be stored on separate secondary containment structures. Proper signage will be installed at each chemical storage area.

All hazardous waste generated will be containerized, labeled, and stored in accordance to standard Resource Conservation Recovery Act (RCRA) and state regulations. All satellite and main hazardous waste storage areas will be properly sized and labeled and temporary storage time periods will conform to RCRA and state regulations. All hazardous waste will be properly labeled and manifested for proper disposal, within the specified holding time periods, in accordance to RCRA and state regulations.

### 3.14.3.1. Reverse Osmosis Solid Waste Accumulation

Ground water will be the optimal water source for operational activities. The ground water for module washing and potable use will require pre-treatment to remove dissolved solids and bacteria. A RO Water Treatment System will be installed to treat the ground water. The waste produced "reject water" from the RO process will be discharged to a properly designed and lined evaporation pond. The water quality for the ground water has high concentrations of dissolved solids (TDS) with an average TDS of 750 and 900 parts per million (ppm). The RO process reject water will have a concentration of approximately 5,000 to 6,000 ppm of TDS. At the peak operating rate, the system will produce approximately 4.2 AFY of reject water.

Assuming a maximum reject water concentration of 6,000 ppm and a maximum production of 4.2 AFY; maximum operations will produce a total of 69,222 pounds (lbs) of solid RO waste a year. This waste will be disposed of at an approved waste facility. Table 3-27 provides the conversion factors to calculate the amount of solids within the aqueous solution.

**Table 3-27.**
**Conversion Factors**

| | |
|---|---|
| 6,000 ppm | 0.006 percent |
| 1 acft | 325,851.429 gallons |
| 1 gallon | 8.43 pounds (lbs) |

*0.006% X 325,851.429 gallons X 8.43 lbs X 4.2 acft/ year = 69,222 lbs of solid waste*

In addition, normal operation debris - wood, scrap metal, paper, food waste, and cardboard - will accumulate. Approximately 40 cubic yards of debris per month is anticipated during normal operations. This debris will be disposed of at an appropriate and approved facility.

### 3.14.4. PV Hazards

The PV modules that may be employed could be polycrystalline, monocrystalline or thin film. Some of these use a Cadmium-Telluride (CdTe) semiconductor technology, and the cadmium in the PV modules is in the environmentally stable form of the CdTe compound rather than a metal (National Renewable Energy Laboratory 2010). A CdTe PV module contains very little cadmium, as it consists of less than 0.1 percent cadmium by weight. During the manufacturing process the thin layer of CdTe, approximately half the width of a human hair, is bound to a glass sheet by vapor transport deposition, followed by sealing the CdTe layer with a laminate material and a second glass sheet. In essence, the design of the module results in complete encapsulation of the CdTe.

When modules are broken, or at the end of their useful life, exposure risks associated with the thin layer of CdTe semi-conductor material are minimized because of the encapsulation of the semi-conductor material within the PV module and because the CdTe can be effectively recycled at the end of the modules‘ life. Recycling will maximize the recovery of valuable materials for use in new modules or other new products and minimize any potential environmental impacts associated with PV system production. Approximately 90 percent of each collected PV module can be recycled into new products, including new PV modules. This provides the end user with strong incentives to use the recycling program. Under current law, PV modules would constitute hazardous waste at end of life and, therefore, could not be disposed in municipal landfill. Whoever owns the modules at that time would be required to adhere to all applicable laws.

### 3.14.4.1. Fire Hazards

The Nevada Fire Safe Council commissioned the Clark County Community Wildfire Risk/Hazard Assessment Project that was published in 2005. This assessment included communities at risk within the vicinity of federal lands that are most vulnerable to the threat of wildfire and was based on five primary factors that affect potential fire hazard:

1. Community design,
2. Construction materials,
3. Defensible space,
4. Availability of fire suppression resources, and
5. Physical conditions such as the vegetative fuel load and topography.

The list of Clark County communities assessed by the Nevada Fire Safe Council included Moapa Town, located 16 miles north, via existing roadways, of the Proposed Project. The Community Hazard Assessment conducted for the Clark County Multi-Jurisdictional Hazard Mitigation Plan (2005) classifies Moapa Town as “Moderate Fire Hazard.” The moderate rating is attributed primarily to a potential for strong fire behavior, limited water, and limited fire suppression resources. These adverse conditions are somewhat mitigated by good access, adequate defensible space, and fire resistant building materials. Regarding fire response and abatement resources, there is a volunteer fire department in Moapa Town, approximately 16 miles to the north:

Clark County Volunteer Fire Station 72- CC
1340 E Highway 168
Moapa Town, NV 89025

Water availability for fire suppression in Moapa Town includes community wells and two tanks with a combined capacity of four million gallons. The water system operates on gravity. Moapa Town also has access to the Muddy River and several ponds for drafting and helicopter dip sites.

The presence of electrical infrastructure over thousands of acres of grassland fuels presents a barrier to firefighting operations. Grass fires occurring within energized arrays can be fought with normal firefighting techniques, while being careful not to damage the arrays and cause an electrical or chemical hazard. The presence of PV arrays could interfere with the protection of property within and directly adjacent to the arrays if access cannot be easily and quickly obtained. Measures to prevent fires and minimize the fuel load will be detailed in a Fire Management Plan, including maintaining vegetation at appropriate levels and reducing potential impacts associated with wildland fire. The Proposed Project solar facility will be bordered by a 20-feet wide fire break that will be graded to bare earth.

#### 3.14.4.2. Transmission Lines and Pipelines

Additional potential sources of hazards or hazardous materials within the Proposed Project are transmission lines and pipelines. There are six transmission lines and the two Kern River natural gas pipelines located west and northwest of the site. The Kern River Pipelines adjacent to the site are parallel 36-inch diameter steel pipes. The Kern River Pipelines run from Wyoming to California. The transmission lines range in size from 138 kV to 500 kV both alternating and direct current styles. Pole structures range from wooden poles and wooden H-frames to singular steel poles and steel lattice towers.

#### 3.14.4.3. Railroads

The eastern boundary of the Proposed Project would be located immediately adjacent to a Union Pacific Railroad ROW, which runs through Dry lake Valley and into Las Vegas. This line connects Los Angeles-Long Beach with Salt Lake City and Union Pacific's transcontinental line to eastern destinations. Major commodities handled by the railroad include coal, chemicals, aggregates, lumber, and consumer goods (Clark County LEPC 2008).

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# 4. Environmental Consequences

## 4.1. Introduction

This chapter analyzes the environmental consequences or impacts expected to occur as a result of implementing the actions described for each alternative in Chapter 2. The Proposed Project and alternatives outlined in Chapter 2, Description of the Proposed Project and Alternatives, may cause, directly or indirectly, changes in the human and physical/natural environment. Current conditions, as described in Chapter 3, were used as the baseline for assessing expected impacts. Potential direct, indirect and cumulative impacts considered in this chapter include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, and health impacts. This EIS assesses and analyzes these potential changes and discloses the impacts to decision makers and the public. This process of disclosure is one of the fundamental aims of the NEPA.

The following sections define and clarify the concepts and terms used in this EIS when discussing the impacts assessment.

### Impacts

Impacts may refer to ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Project or alternatives. Impacts may be direct, indirect, or cumulative.

### Direct Impacts

A direct effect occurs at the same time and place as the action. Direct and indirect impacts are discussed in combination under each affected resource.

### Indirect Impacts

Indirect impacts are reasonably foreseeable impacts that occur later in time or are separated by some distance from the action. Direct and indirect impacts are discussed in combination under each affected resource.

### Cumulative Impacts

Impacts on a resource are cumulative when added to the impacts (or anticipated impacts) from other past, present, or future proposed projects in the area of the Proposed Project. The cumulative impacts area may be larger than the direct impacts area.

### Residual and Irreversible or Irretrievable Impacts

Impacts are considered residual when the effect from the Proposed Project cannot be completely avoided or minimized and remains after or despite mitigation. Irreversible or irretrievable impacts are generally defined as the commitment of non-renewable resources that are renewable only over very long periods of time or the commitment of renewable resources and represents a loss of production, harvest or some use of a natural resource, respectively.

### Significance, Intensity and Context

"Significant" has a very particular meaning when used in a NEPA document. Significance is defined by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations (CFR) 1508.27) as a measure of the intensity and context of the impacts of a major federal action on, or the importance of that action to, the human environment. Significance is a function of the beneficial and adverse impacts of an action on the environment.

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining the intensity of the effect.

Context means that the effect(s) of an action must be analyzed within a framework or within physical or conceptual limits. Resource disciplines, location, type, or size of area affected (e.g., local, regional, national) and affected interests are all elements of context that ultimately determine significance. Both long- and short-term impacts are relevant.

### Impact Indicators

Use of the term "significant" when referring to impacts indicates that some threshold was exceeded for a particular impact indicator. Impact indicators are the consistent currency used to determine quality, intensity, and duration of change in a resource. Working from an established existing condition (i.e., the baseline conditions described in Chapter 3), this indicator would be used to predict or detect change in a resource related to causal impacts of proposed projects.

### Adverse

The effect is negative to a particular resource or a number of resources.

### Beneficial

The effect is positive to a particular resource or a number of resources.

**Negligible or No Impact**

The effect is at the lowest level of detection; change would be difficult to measure.

**Mitigation**

Where applicable, mitigation measures are proposed in this document. Mitigation measures are solutions to environmental impacts that are applied in the impact analysis to reduce intensity or eliminate the impacts. To be adequate and effective, CEQ regulations (40 CFR 1508.20) require that mitigation measures fit into one of five categories:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

5. Compensating for the impact by replacing or providing substitute resources or environments.

The environmental analysis and documents produced in the NEPA process should provide the decision-maker with relevant and timely information about the environmental effects of the decision and reasonable alternatives to mitigate these impacts.

## 4.2. Climate

Climate change issues arise in relation to the consideration of (1) the effects of GHG emissions from the Proposed Project and alternative actions, and (2) the relationship of climate change effects to the Proposed Project or alternatives, including the relationship to proposed design, environmental impacts, mitigation, and adaptation measures. Effects of GHG emissions from the Proposed Project and each alternative are presented in the following sections. Effects of climate change from current conditions are discussed in Section 3.2.1, Climate Change.

### 4.2.1. Indicators

Greenhouse gas impacts from the Proposed Project would affect the environment if they would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment and/or hinder the state's goals of reducing GHG emissions

### 4.2.2. Direct and Indirect Effects by Alternatives

#### The Proposed Project

Short-term, adverse effects on air quality conditions would result from construction and decommissioning. Exhaust and fugitive dust emissions generated from construction equipment and vehicles would increase ambient concentrations of air pollutants. Wind-driven emissions of fugitive dust would be generated following disturbance by construction activities, including travel on roads. Soil-derived particles can obstruct visibility, cause property damage, and/or contribute to violations of air quality standards for fine particles. However, these emissions of engine exhaust and fugitive dust are not expected to contribute to regional exceedances of criteria air pollutant National Ambient Air Quality Standards (NAAQS) for which the areas have been designated as nonattainment.

The Proposed Project is located within the hydrographic area identified as California Wash. It is assumed that vehicle traffic associated with Proposed Project construction would occur on I-15 between the Proposed Project and Las Vegas, Nevada.

As indicated above, the types of emissions generated during decommissioning of the Proposed Project would be similar to those generated during Proposed Project construction. It is expected that decommissioning activities would result in lower emissions than for construction. Effort and resultant emissions would be similar for construction and for decommissioning; since air quality impacts from construction would not be significant, air quality impacts from decommissioning would not be significant, either.

The air quality impacts associated with the Proposed Project construction and decommissioning would be temporary. A discussion of long-term impacts associated with the Proposed Project operation and site restoration following potential decommissioning is given below.

The construction phase of the Proposed Project would temporarily cause fugitive dust related to grading, drilling and other construction activities. The Proposed Project would comply with Clark County dust control requirements, even though such requirements are not applicable on tribal lands, and the Applicant would use water to control dust. Currently, only water is approved for dust control within potential threatened and endangered (T&E) species habitat.

The Proposed Project would implement the following BMPs for fugitive dust and wind erosion control:

- Minimize grading and vegetation removal as practical, and limit surface disturbance during construction to the time just before PV module support structure installation;
- Limit vehicular speeds on non-paved roads through use of monitors and speed limit signs at various locations along the access road. (Clark County ordinance speed limit is 25 miles per hour);
- Apply water to disturbed soil areas of the Proposed Project to control dust and maintain optimum moisture levels for compaction, as needed. Apply the water using water trucks. Minimize water application rates, as necessary, to prevent runoff and ponding;
- During windy conditions (forecast or actual wind conditions of approximately 25 miles per hour or greater), apply dust control measures to haul roads to adequately control wind erosion. Cover exposed stockpiled material areas;
- Gravel or other similar material would be used where dirt access roads intersect the paved roadways to prevent mud and dirt track-out. All paved roads would be kept clean of objectionable amounts of mud, dirt, or debris, as necessary;
- Suspend excavation and grading during periods of high winds; and
- Cover all trucks hauling soil and other loose material or maintain at least 2 feet of freeboard.

### Long-Term Operations

Ongoing emissions associated with operation of the Proposed Project would include combustion emissions from worker commutes, delivery trips, and construction equipment and limited fugitive dust from inspection and maintenance vehicles traveling on unpaved roads.

The Proposed Project would require an operational workforce of approximately 35 full-time equivalent (FTE) positions. This workforce would include administrative and management personnel, operators, security, and maintenance personnel. Operation and Maintenance (O&M) would require the use of vehicles and equipment including trucks for on-site welding and panel washing, all-terrain vehicles, and crane trucks for minor equipment maintenance. Additional maintenance equipment would include forklifts, bucket trucks, and chemical application equipment for weed abatement. Flatbed trucks, dump trucks, and pick-up trucks would be used as needed on the Proposed Project.

Long-term, ongoing emissions associated with operation of the proposed facility would be relatively minor. There would be no large combustion sources on the site other than fuel combustion for maintenance vehicles. Fugitive dust emissions would continue from O&M vehicles traveling on the gravel roads. During Proposed Project operation, dust management needs would be minimal, as fugitive dust-generating activities such as vehicle traffic are limited. Vehicular traffic during operations is primarily related to periodic inspections and minor repairs of solar generating equipment. Further, due to the solar panels' relatively fixed orientation and placement low to the ground, the panels themselves would shield the ground from prevailing winds, causing fewer impacts to surface soils. The actual production of electricity from the solar field does not result in emissions. Nonetheless, the following practices would be implemented to further reduce the potential for fugitive dust during plant operation:

- Vehicular speeds on non-paved roads and access ways would be limited to 25mph.
- Regular field inspections and repair activities would be suspended during periods of high winds, and water trucks would be used, as applicable.

The estimated yearly emissions totals for $O_3$ precursors (NOX and VOCs) associated with ongoing Proposed Project operation would be less than the de minimis thresholds specified under the Federal General Conformity Rule (40 CFR 93); thus, Proposed Project operation-related emissions are assumed to conform to the State Implementation Plan (SIP) and regional air quality plans. Decommissioning of the site (e.g., grading or removal of vegetation) could result in dust generation. To ensure that decommissioning would not have an adverse effect, a Facility Decommissioning Plan would be developed and approved by the BIA and Tribe at least six months prior to commencement of site closure activities. The Plan would address future land-use plans, impacts, and mitigation associated with closure activities, the schedule of closure activities, equipment to remain on the site, and conformance of the plan to applicable regulatory requirements and resource plans. The Facility Decommissioning Plan would be consistent with requirements and goals set forth in the Site Restoration Plan. The extent of site closure activities would be determined at the time of the closure, in accordance with the Facility Decommissioning Plan. Potential closure activities could include re-grading and restoration of original site contours and re-vegetation of areas disturbed by closure activities in accordance with the Site Restoration Plan.

### Benefit

It should be noted that long-term generation of renewable electricity through solar power will have long-term air quality benefits as part of regional and national goals to replace other forms of electricity production that may generate much higher levels of air pollutant and GHG emissions.

The operation of the Proposed Project would contribute to the declared goal of increasing the proportion of energy generated in the state that comes from renewable sources.

#### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Compared to the Proposed Project, Alternative I would represent decreased impacts from earth-moving and grading, and a reduction in overall construction schedule by reducing the overall solar facility size. The difference in placement of the up to 500kV transmission line between the Proposed Project and this alternative is minimal; therefore, impacts would be similar in both cases. The access road and 12kV transmission line would also be the same or similar, respectively. The beneficial impacts to climate and GHGs would be less than those of the Proposed Project. It is further expected that the same measures used to control fugitive dust under the Proposed Project would also be used under this alternative.

#### No Action Alternative

The No Action Alternative assumes that the Proposed Project would not be built. Under this alternative, there would be no construction or operational emissions; thus, there would be no direct or indirect effects on climate or emissions of GHGs. There would be no benefit from the replacement of fossil fuel generated energy with solar generated energy from the Proposed Project.

### 4.2.3. Residual Effects

All climate and GHG impacts were assessed as if all Applicant-proposed mitigation measures (discussed above), BMPs, and other design features of the alternatives have been applied. Therefore, there is no difference between residual effects and Proposed Project impacts, as discussed above.

## 4.3. Topography, Geology and Geologic Hazards

This section discusses effects on existing topography, geology, and geologic hazards that may occur with implementation of the Proposed Project or alternatives.

### 4.3.1. Indicators

The Proposed Project would affect topography, geologic resources or be affected by geologic hazards if it would:

- Be located on a geologic unit that is unstable or would become unstable as a result of the Proposed Project and result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse;
- Result in physical alteration to topographic features;

- Result in physical alteration of or damage to geologic features; or
- Present a significant threat to public safety due to damage to Proposed Project components by geologic hazards.

### 4.3.2. Direct and Indirect Effects by Alternatives

This section describes effects under each alternative following the requirements described under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource.

#### The Proposed Project

Under this alternative the Proposed Project would be implemented. Effects that could result from the implementation of the Proposed Project during construction, O&M, or decommissioning activities are discussed below:

*1. Geologic unit that is unstable or would become unstable as a result of the Proposed Project and result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse.*

The Proposed Project is located in the California Wash sub-area of Dry Lake Valley in northeastern Clark County, Nevada. Dry Lake Valley is a broad, northeast-trending, alluvium-filled valley bounded on the east by the Muddy Mountains and to the west by the Arrow Canyon mountain range. Extreme rain events can result in the suspension and transportation of sand, gravel, or even boulders, which can cause structural damage. Additionally, earthquakes and human activities can result in landslides; however, the site is categorized as having low susceptibility to and incidence of landslides due to the site being located on a mesa.

No construction or operational activity would alter the character of the underlying mesa to make it less stable. Maintenance of the natural terrain and its existing drainage system would facilitate natural drainage through the site. Although the site is located on a mesa where sediments have the potential for movement during large precipitation events, the Proposed Project would be constructed to minimize that potential movement by using the natural on-site drainage. Therefore, it is not likely that the geologic unit would become unstable as a result of the Proposed Project. In addition, all excavations associated with the Proposed Project would be filled with industry approved soil or foundation material. The presence of subterranean void spaces can contribute to subsidence, landslides, and/or collapse. As the Proposed Project would not create subterranean void spaces, the Proposed Project would not increase the geologic instability of the area and would not increase the risk of on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse.

*2. Physical alteration to topography*

Grading or blading of the solar site facility is a minor long-term non-significant effect to the topography of the site. No large scale mining or excavations will take place for the construction of the Proposed Project; therefore, only negligible effect on topography would occur.

*3. Physical alteration of or damage to geologic features.*

To provide water for construction and operation of the Proposed Project, the existing TH-1 well located west of the solar facility will be tapped. Any effects on subsurface geologic features resulting from withdrawing the groundwater would be localized. No unique geologic features were identified at the site; therefore, no effect on a unique geologic feature would occur.

*4. Proposed Project components damaged by geologic hazards present a threat to public safety.*

Much of the Western United States is a region of moderate to intense seismicity related to movement of crustal masses (plate tectonics). By far, the most active regions, outside of Alaska, are in the vicinity of the San Andreas Fault system of western California. Other seismically-active areas include the Wasatch Front in Salt Lake City, Utah, which forms the eastern boundary of the Basin and Range physiographic province, and the eastern front of the Sierra Nevada Mountains, which is the western margin of the province. The Proposed Project lies within Dry Lake Valley in the central portion of the Basin and Range physiographic province, which is an area subject to periodic earthquake shaking. The USGS (2007) reports 80 earthquakes of magnitude 4.0 or greater have occurred within 100 miles of the site since 1973. Of these, only 12 were of magnitude 5.0 or greater and none exceeded magnitude 5.6. It must be recognized that there are probably few regions in the United States not underlain at some depth by older bedrock faults. Even areas within the interior of North America have a history of strong seismic activity.

The Proposed Project lies within an area with a moderate to high potential for strong earthquake shaking. Seismicity within the area is considered about average for the central Basin and Range Province (Ryall and Douglas, 1976). The USGS indicates there is a 40 percent chance of a magnitude 5.0 or greater earthquake in the Proposed Project area in the next 50 years.

An earthquake could cause structural damage on-site; however, all Proposed Project structures would comply with applicable seismic codes. Therefore, earthquake-related damage to structural components of the Proposed Project would be minimal and confined to the site. Furthermore, there have not been any earthquakes with a magnitude of 5.0 or higher on the Richter scale within the Proposed Project since 1900. Because most of the site would be fenced and in a remote area, very few, if any, members of the public would be exposed to potential earthquake damage at the facility; however, workers and wildlife could be exposed to earthquake damage at the facility.

The alluvium at the site could be transported during flash floods and damage on-site structures, such as solar panels, fencing, etc. Flash flood events could result in on-site damage that could represent a hazard to on-site workers or wildlife. The size, frequency, and intensity of flash flood events and associated damage has not been documented in this area. It is possible that a major flash flood could result in damage downslope of the site.

Topography within the proposed solar facility will be impacted as a result of grading and leveling to meet the design standards for solar module placement. Areas of rolling terrain would be graded to a nominal slope so that solar panels can be similarly aligned within the vertical dimension.

Compliance with Clark County seismic building codes and maintaining the natural drainage would minimize potential risk associated with the most likely geologic hazards in the area; however, once these events occur, they can strain or stress the existing infrastructure. With proper construction engineering and BMPs, potential short- or long-term adverse effects related to the recurrence of these types of events would be reduced and any damage addressed, such that they would be short-term and localized.

#### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Effects under Alternative I would be the similar to those identified under the Proposed Project with the exception of less grading and topographical impact due to the reduced solar facility footprint. The same mitigation used for the Proposed Project would be applicable for Alternative I.

#### No Action Alternative

Under this alternative, there would be no construction; thus, there would be no effect on topography or geology.

### 4.3.3. Residual Effects

Given that there would be no direct or indirect impacts to topography, geology or geologic hazards, there would be no residual impacts from the Proposed Project.

## 4.4. Soils

This section discusses effects on soil resources that may occur with implementation of the Proposed Project or alternatives. The indicators used to identify and analyze effects are presented and potential effects and agency-recommended mitigation measures are discussed.

### 4.4.1. Indicators

The Proposed Project would affect soil resources if it would:

- Increase erosion rates;
- Reduce soil productivity by compaction or soil mixing to a level that would prevent successful rehabilitation and eventual reestablishment of vegetative cover to the recommended or preconstruction composition and density; or
- Increase exposure of human or ecological receptors to potentially hazardous levels of chemicals or explosives due to the disturbance of contaminated soils or to the discharge or disposal of hazardous materials into soils.

### 4.4.2. Direct and Indirect Effects by Alternatives

This section describes effects under each alternative following the requirements described under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource area.

#### The Proposed Project

Implementation of the Proposed Project could result in several effects on soils. Effects are detailed below, along with corresponding mitigation measures that would reduce effects on soils.

*1. Increase in soil erosion rates.*

Several factors affect the potential for soil to be eroded by water or wind, including soil texture, the length and percent of slope, vegetative cover, and intensity of rainfall or wind. Construction and O&M of the Proposed Project would affect up to approximately 1,600 acres of land through clearing and grading, as well as construction of impermeable surfaces throughout the Proposed Project over a five-year period (proposed for 2012 through 2016). Within the 1,600 acres, grading or blading would be limited as much as practicable using module pole-height adjustment to achieve a level solar array where topographical variance is minimal.

As discussed in section 3.3, Soils, the Tonopah Gravel, Bard Gravel, Badland, and Mormon Mesa soil series are all classified by wind erodibility; for these soils the description is "erosion not a problem." Hence, undisturbed soils within the Proposed

Project are not subject to wind erosion. During construction, the Applicant could clear and grade up to 1,600 acres within the solar facility boundary. This removal of the vegetation and soil crusts and grading would expose soil and increase the potential for wind- and water-driven erosion. The Proposed Project is relatively flat, but it has the potential for high winds and infrequent strong rains. The use of vehicles and equipment on these areas would further increase the potential for both wind- and water-driven erosion. Therefore, there would be a strong potential for wind and water erosion within the Proposed Project.

To reduce the potential for water-driven erosion, the Applicant has designed an erosion control and stormwater drainage plan (incorporated into the SWPPP). As part of this system, the majority of the Proposed Project would be drained by sheet flow to on- and off-site drainages. The drainage plan would use existing natural washes, by improving and diminishing sheet flow runoff, and allow the remaining stormwater flow to pass through the site naturally. The drainage control features would consist of stormwater flow-corridor reinforcement, berms within the solar array, rock weirs or gabions within existing drainage channels and/or other energy decreasers to minimize scour and erosion from the site and within natural washes. These features would be designed to protect the integrity of existing drainages, not to channelize all flow within the site.

Construction of the erosion control system would reduce water erosion susceptibility within the project area and down-gradient parcels. To further ensure that soil erosion is minimized, the Applicant has incorporated a series of BMPs into their Proposed Project (see Chapter 2, Description of the Proposed Project and Alternatives, for more detail). Implementation of these BMPs would reduce localized soil impacts resulting from wind and water erosion; however, they would not eliminate all soil loss within the Proposed Project.

Wind erosion would be increased due to the removal and maintenance of vegetation within the Proposed Project, likely resulting in a localized loss of topsoil. The water pipeline would be constructed within a 25-foot wide temporary construction corridor with impacts to soils localized within the active trench and temporary spoil placement area. The transmission lines would only impact soils where pole structures are placed within mechanically-augured holes. Some soil disturbance may occur due to vehicles driving along the proposed transmission ROWs.

2. *Reduce soil productivity.*

The soils that comprise the Proposed Project provide support for desert vegetation and provide wildlife habitat. Impacts to local flora and fauna are discussed in Section 4.6, Biological Resources Impacts. To reduce effects on soil production, the Applicant proposes to limit the area of grading and reserve the top layer of native soil where appropriate. After construction, the salvaged soil would be replaced to provide a homogenous appearance as well as preserve sensitive soils and seed banks. Salvaged soil would be held on-site until it is used for restoration. Soil productivity may be negligible if best management practices as discussed are implemented.

*3. Increase exposure of contaminated soils.*

The Proposed Project site does not contain any contaminated or hazardous soils. The applicant will make all effort to use native soil for on-site construction. The remaining soil material would be obtained from an off-site source with an approved soil type that is suitable for construction purposes and most closely matches existing site soils. The Applicant will ensure that imported soils are free from contaminants before use on the Proposed Project. The Applicant will ensure that imported soils are consistent in texture and drainage characteristics with existing on-site soils before use on the site.

#### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Alternative I would produce similar effects on soils as describe in the Proposed Project, with the exception of the volume of off-site soil used and overall reduction of soil impacts due to the reduced solar facility footprint. The decreased length of the alternative up to 500kV transmission line would also reduce overall impacts to soils.

#### No Action Alternative

The No Action Alternative assumes that there would be no construction; thus, there would be no effect on soil resources.

### 4.4.3. Residual Effects

Construction, operation, and decommissioning of the Proposed Project would increase the potential for localized flooding and downgrade soil loss through wind and water erosion. Although the Applicant will design an extensive water erosion control system and is committed to a series of BMPs, localized soil erosion can be expected. These residual impacts would be most prevalent on dry, windy days, when wind erosion underneath the panels would be greatest, and during flash flood events larger than the 100-year flood, when water volume may exceed the capacity of the flood control system. Either residual impact would be localized to the Proposed Project area and only occur during unique climatic conditions.

## 4.5. Water Resources

This section discusses effects on water resources/hydrology that may occur with implementation of the Proposed Project or alternatives.

### 4.5.1. Indicators

The Proposed Project would affect water/hydrology resources if it would:

- Decrease groundwater supply or interfere substantially with groundwater recharge;
- Degrade the quality of groundwater such that it is no longer suitable for its intended use;
- Degrade the quality of surface water by increasing erosion, increasing sedimentation, or introducing contaminated waters; or
- Increase the potential for flood hazards.

### 4.5.2. Direct and Indirect Effects by Alternatives

This section describes effects under each alternative following the requirements described under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

#### The Proposed Project

*1. Decrease groundwater supply or interfere substantially with groundwater recharge.*

As described in Chapter 2, Description of the Proposed Project and Alternatives, the Proposed Project would require 72 AFY for the construction period and no more than 20 to 40 AFY for O&M activities. Water is needed for dust suppression during construction, PV panel cleaning during operation as well as for worker daily consumptive uses during O&M. It is assumed that 0.5-0.75 gallons of water per 9 square feet is required for dust suppression and each worker will need 3 gallons of water per day for drinking and washing purposes. For the operation phase of the Proposed Project, water will be required mainly for panel cleanings, facility dust control and worker consumptive uses.

Water would be supplied from one of the existing Reservation wells, TH-1, which is capable of producing 60 gpm of water. Its primary purpose would be to provide water for dust suppression during construction and operation. As mentioned in Section 3, the Tribe has been permitted to 2,500 AFY of water by the State. The Tribe has more than enough water rights to support the amount of water needed for the Proposed Project during the construction and the operation phases, as well as satisfy the Tribe's needs at the nearby Travel Plaza.

The potential impacts of the Proposed Project's water withdrawal on area wells were evaluated in the Hydrogeologic and Groundwater Modeling Analysis for the Calpine Company Moapa Paiute Energy Center proposed project (Mifflin 2001) as well as a PBO issues by the USFWS in 2005 (See Section 3.8.3 and 4.8.4.1) . The proposed energy project required 7,000 AFY of groundwater extraction from the California Wash hydrographic basin for purposes of electric power generation. The study uses various models/simulations to estimate 25- and 45-year drawdown and to assess the impacts of the proposed 7,000-AFY appropriation in the site area and hydrologic impacts in major spring areas.

The Proposed Project is using one of the wells from the same well field as analyzed in the Calpine proposed project Draft EIS (Well TH-1). Modeling results showed that there were no foreseen impacts to groundwater users given the depths to water in the region (hundreds of feet) and maximum drawdowns of only several feet (2 to 4 feet) for the life of the Calpine project (45 years).

Three modeling scenarios were developed by varying boundary conditions to demonstrate the range of credible impacts of 7,000-AFY pumping stress from the Belly Tank Flat area (where TH-1 is located) on the Muddy River Springs Area, assuming hydraulic continuity between the areas (Mifflin 2001). At the time of the study, the average flow to the discharge area was approximately 51 cubic feet per second (cfs).

Scenario one, which was judged the most probable response of the natural system to pumping, produces a decrease in the Muddy River Springs Area discharge of about 1 percent at 25 years and 1.3 percent in 45 years. These are equivalent to about 0.5 cfs of the 51 cfs, which, on average, flows to the discharge area.

Scenario two, which was less probable, resulted in reduction of the Muddy River Springs Area discharge of about 1 percent in 25 years and a 1.1 percent in 45 years.

Scenario three is the least probable case in there was a projected 7.5 percent reduction in flow to the Muddy River Springs Area in 25 years and a 10 percent decrease at 45 years (or a 5 cfs decrease).

The modeling analyses concluded that only under the least probable scenario are observable changes to the Muddy River Springs Area hydrology expected, and those would only occur during prolonged drought periods.

Given the water needs for the Calpine proposed project was almost 100 times larger than the water requirement of the Proposed Project, it can be concluded that there would be no impacts to the area groundwater or discharge to neighboring springs, separately or cumulatively.

As mentioned in Section 3.5.3, the carbonate rocks aquifer of the California Wash Basin is recharged by infiltration of precipitation to the subsurface. Increasing the amount of impervious surfaces in an area can adversely affect groundwater recharge by decreasing the amount of water that infiltrates to the subsurface. The Proposed Project would include new impervious areas at the O&M site, substation, and paved roadways (if required); it is unknown at this time what the percent impervious area as a result of the infrastructure will total. It is currently estimated that a maximum of 1,400 acres (2.18 square miles) of the 2,000 acres may be graded for infrastructure placement. As mentioned in Section 3.5, the California Wash Basin covers 318 square miles. Assuming all of the graded area would become impervious, this would only account for about 0.68 percent of the entire California Wash Basin. Therefore negative effects to groundwater recharge due to construction and operation of the Proposed Project would be unlikely.

*2. Degrade the quality of groundwater such that it is no longer suitable for its intended use.*

Spills of chemicals and petroleum products can degrade groundwater quality such that it is no longer suitable for its intended use. The Proposed Project would use small amounts of hazardous materials during construction and operation (see Section 3.13, Human Health and Safety/Hazardous Materials, for more information about quantities of hazardous materials). Petroleum spills would be possible while refueling equipment during construction and operation of the Proposed Project. During operations, transformers would be used and would be located throughout the solar array field and at each of the two substations. Transformers would be air cooled or require insulating oil with approximately 70,000 gallons for initial fill and 500-1,000 gallons stored on-site during operation and would be installed with secondary containment. Approximately 175, 2,500 kVA transformers, each containing 250-300 gallons of mineral insulating oil, would be located throughout the solar array field. The substation would house up to three (3) 167 MVA transformers containing approximately 4,000 gallons of insulating oil each.

As described in Section 3.4, Groundwater Resources, groundwater is located around 300 to 500 feet below ground surface. The Applicant has stated that a SPCC Plan would be developed and implemented to protect the environment from petroleum product spills during operation. Adequately-sized secondary spill containment will be incorporated with all chemical storage vessels to ensure proper capture and control measures for potential spills. The Applicant has also stated that an emergency response plan would be developed to address emergencies including leaks and spills during construction. Successful implementation of the SPCC and emergency response plans would minimize the potential for a spill and detail the measures to cleanup any spills that occur. In addition, groundwater is located 300 to 500 feet below ground surface; therefore, it is unlikely that any surface spill would infiltrate to groundwater.

Spills of chemical and petroleum products can degrade groundwater quality such that it is no longer suitable for its intended use. As stated in Section 3.13, the potential for encountering hazards and hazardous material sites in the Proposed Project during construction and operation is considered very unlikely.

The groundwater of the California Wash Basin contains relatively high concentrations of TDS and sulfate; therefore, it is necessary to install a RO treatment facility to remove these constituents from the water to be used for panel cleaning. The removal of concentrated water with dissolved solids is part of the RO process and is considered "reject" water. This reject water will be discharged to a designated evaporation pond that will be properly sized and protected to accept reject water, and lined to prevent percolation.

3. *Degrade the quality of surface waters by increasing erosion, increasing sedimentation, or introducing contaminated waters.*

Surface water quality can be degraded by increasing rates of erosion and sedimentation, introducing contaminants, violating water quality standards, or otherwise changing the character of surface waters. As described in Section 3.4.1, Surface Water Resources, the Proposed Project would be within the Dry Lake Valley area of the Mojave Desert where there is very little precipitation. There are no perennial water bodies within the Proposed Project site. Therefore, there are no surface water quality data available to measure potential impacts against. As described in the groundwater discussion, small amounts of chemicals solvents, herbicides, and petroleum products would be used during construction and operation of the Proposed Project. Additionally, large volumes of insulating oil would be used and stored in the transformers. The greatest potential for contamination of surface water from these materials would be from petroleum products at the transformers and vehicle refueling stations. The Applicant's emergency response plan (construction phase) and SPCC Plan (operation phase) would provide for hazardous material spill prevention and clean-up measures, were a spill to occur.

There would be potential for increased erosion or sedimentation on-site or off-site due to Proposed Project construction and O&M activities. Although there are no perennial waterbodies within the Proposed Project, there are six drainages (dry washes and sheet flows) in the solar facility boundary that are characteristic of alluvial fans where ephemeral surface water flows. Water from these drainages flows ultimately into the California Wash and then the Muddy River. It is expected that bed loads and suspended loads are quite high during significant storm events. The Applicant will incorporate construction-phase erosion and sediment control measures consistent with regional BMPs and federal, state, and local regulations including the Proposed Project's General Permit (issued by EPA) and SWPPP. These measures would control erosion and sediment transport during construction.

There would likely be effects that last beyond the construction period and terms of the General Permit and SWPPP. Although the Applicant proposes to maintain existing drainage patterns throughout the solar field, construction and operation of the Proposed Project activities would likely change natural runoff patterns, thereby affecting erosion and deposition.

Construction activities causing ground disturbance, such as grading and de-vegetation, and installation and operation of the Proposed Project components would disrupt the soil surface and dislodge biological crusts that bind soil together. Except for specific cactus and yucca species specified for protection by the Tribe, all cleared vegetation would be tilled under, mulched or composted (at Tribal facility), and retained on-site to assist in erosion control and limit waste disposal. In some areas to be graded outside of the solar field, native vegetation would possibly be harvested for replanting to augment soil stabilization. These activities would likely have long-term adverse effects on surface water quality, by increasing the amount of soil erosion in and downstream of the Proposed Project. These effects would diminish over time, if left undisturbed, as the soil crust evolves and vegetation is re-established.

The Applicant proposes to construct outside the six main drainages where steep cliffs and deep channels inhibit solar module placement. Across the remainder of the site, drainage occurs via sheet flow and in smaller washes that feed into the six main drainages. Under the proposed drainage plan, berms will be constructed to direct the surface flow into the six drainages and off-site. There would be breaks in the berms to allow upslope flow to enter the larger drainages. Concrete weirs or rock gabions may also be used within the drainages to control flash flooding downstream and reduce sediment transport.

During site preparation, the Applicant would prepare ungraded surfaces by cutting vegetation to a height of less than 12 inches. Desert vegetation performs several vital functions including soil stabilization and slowing of stormwater flows. As described in Section 4.6.2, Direct and Indirect Effects by Alternative, there would likely be loss in vegetative cover due to mowing of portions of the site and subsequent shading by the PV modules. Therefore, some vegetation would not be performing its functions of slowing stormwater and stabilizing the soil and this may result in increased erosion and sedimentation, both on- and off-site. Under pre-development conditions, during rain events precipitation is evenly distributed across the ground. With construction of the Proposed Project, precipitation would flow off the modules and would be concentrated at the lower ends of the panels, which may create localized gullies that would alter surface water flow. This would potentially result in increased erosion throughout the solar array field and the potential for increased sedimentation both on- and off-site.

The Applicant would conduct biannual and post-storm monitoring of erosion and sedimentation. If localized gullies were to result in increased rates of erosion and sedimentation, the Applicant would be required to revise erosion and sedimentation control measures. Changes to the site surface, including de-vegetation, gullying, and berm installation, would likely result in increased erosion and sedimentation both on- and off-site for the life of the Proposed Project.

The Applicant will develop and implement erosion and sedimentation control measures to be used to minimize impacts during the life of the Proposed Project. At a minimum, these controls will include:

- Soil stabilization measures to offset loss of vegetation;
- Biannual and post-storm monitoring of erosion and sedimentation; and
- Adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water collection on or at the site. The erosion and sediment control measures and SWPPP must be approved by the Tribe prior to the beginning of Proposed Project construction.

*4. Increase the potential for flooding hazards.*

Development could result in an increase in flooding hazard if it were to:

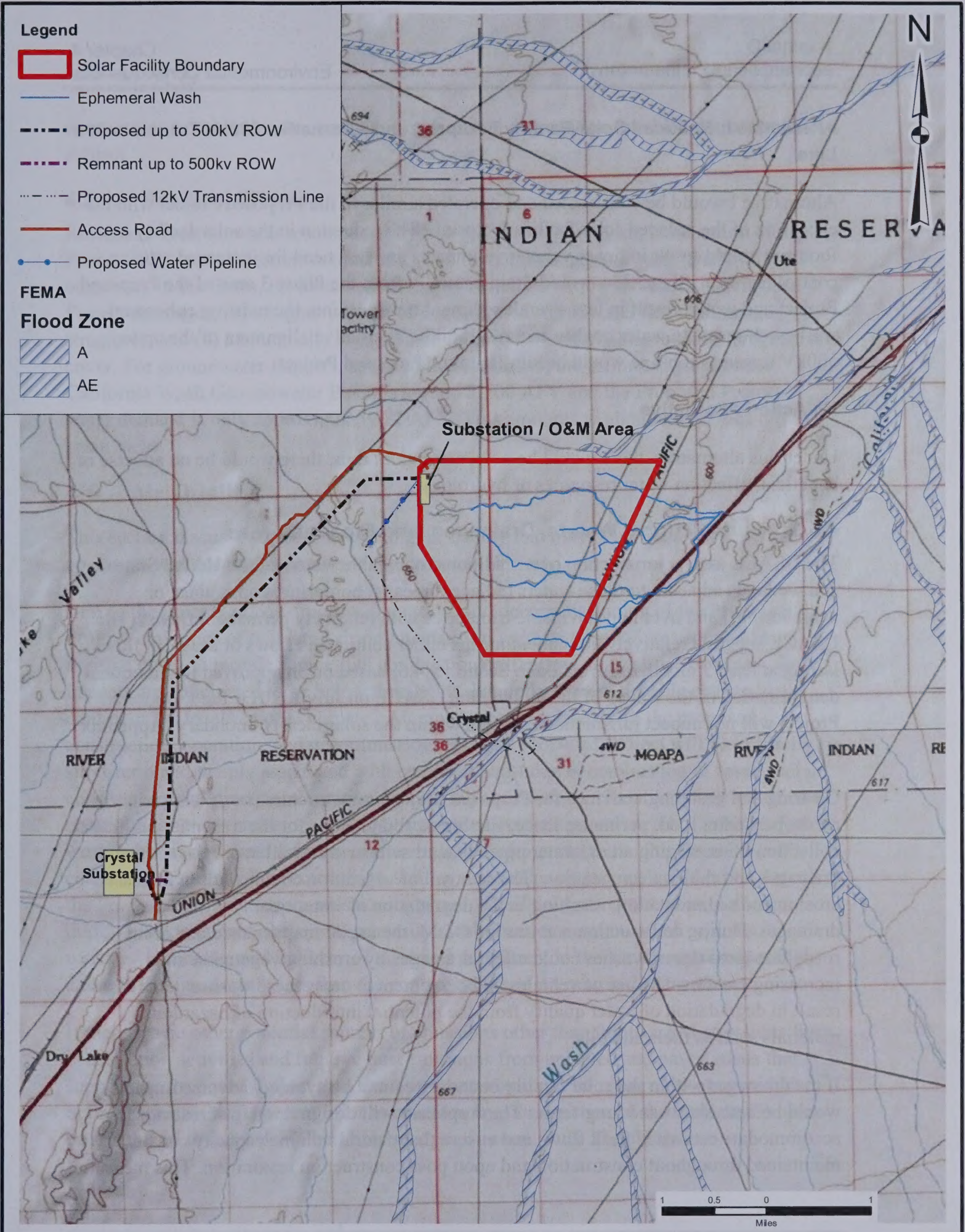
- Impede or redirect flood flows;
- Cause inundation or additional risk associated with a debris flow; or
- Otherwise increase the rate or amount of surface water leaving the site.

Flood hazards can increase due to multiple factors, including alteration of the natural drainage of an area to prevent adequate water flow, reducing the area within which precipitation and runoff infiltrate, and increasing the impervious surface area in a region. There are six major drainages that transect the Proposed Project. In order to reinforce the existing drainages and prevent lateral channel migration over the life of the Proposed Project, the Applicant would construct berms to reinforce the drainage banks. The berms would be designed to accommodate the 100-year flood event and include a bulking factor for high sediment load and riprap to minimize scour. The berms would serve to reinforce the natural washes and are not intended to redirect significant amounts of stormwater into the washes.

To decrease downstream peak flows, concrete weirs or rock gabions will be constructed within the six major drainages at key locations to minimize velocity and decrease sediment transport that may have an effect upon the downstream alluvial fan before exiting under existing railroad culverts. Sediment deposits on the upstream side of the gabions will be manually maintained throughout operations to ensure minimal downstream sedimentation. Sediments would be moved to an upland area or taken offsite to an approved location.

Across the remainder of the Proposed Project, drainage occurs via sheet flow and in smaller washes that feed the six large drainages. There would be breaks in the berms to allow upslope flow to enter the larger drainages. The Proposed Project does not contain any FEMA flood zones (Figure 4-1). A flood zone runs adjacent to the north side of the Proposed Project. Extreme rain events can suspend sand, gravel, or even boulders, and transport them downstream or downslope, resulting in damage to structures impacted by flood waters (USGS 2001). The Proposed Project is located on a large mesa and flooding is considered highly unlikely. With proper implementation of these mitigation measures, including adaptive management of practices, effects related to flooding would be reduced to negligible levels. As post-development flow would not be expected to exceed pre-development flow, the existing culverts under the railroad would not need to be resized with implementation of the Proposed Project.

Water quality impacts as a result of the water pipeline and transmission lines would be minimal and temporary. No permanent structures would be placed within an ephemeral wash outside of the solar facility boundary. The water pipeline ROW will be restored to pre-construction contours and therefore natural flow and downstream sedimentation would not be affected.


Legend
Solar Facility Boundary
Ephemeral Wash
Proposed up to 500kV ROW
Remnant up to 500kv ROW
Proposed 12kV Transmission Line
Access Road
Proposed Water Pipeline
FEMA
Flood Zone
A
AE
N
Substation / O&M Area
INDIAN
RESERVA
Ute
Tower
acility
Valley
Crystal
RIVER
INDIAN
RESERVATION
MOAPA
RIVER
INDIAN
4WD
PACIFIC
UNION
Crystal Substation
Dry Lake
Wash
California
15
36
31
1
6
12
7
694
606
600
650
612
617
663
667
1
0.5
0
1
Miles

Map Document: Austin/6923001/GIS/MXD/BLM Lands Figure 1

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Project

Moapa River Indian Reservation

FEMA 100 Year Flood Zone

MALCOLM PIRNIE, INC.

February 2012

FIGURE 4-1

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Alternative I would be constructed and operated similar to the Proposed Project with the exception of the reduced solar facility footprint. The reduction in the solar facility footprint would result in fewer vegetative impacts and less need for increased erosion control features. Sheet flow would drain naturally from the Phase 3 area of the Proposed Project and would result in less overall sediment transport into the existing ephemeral washes. Impacts to water quality as a result of the alternative alignment of the up to 500kV transmission line would be similar to the Proposed Project.

### No Action Alternative

Under this alternative, there would be no construction; thus, there would be no adverse or beneficial effect on water resources or hydrology.

## 4.5.3. Jurisdictional Waters, Drainages, and Riparian Areas

The USACE asserts jurisdiction over traditional navigable waters of the United States and wetlands adjacent to those waters (adjacent means ‘bordering, contiguous, or neighboring’) and over non-navigable tributaries with relatively permanent flows. (The USACE suggests relatively permanent means either continuous flows or seasonal flows lasting at least 3 months.) As stated in Section 3.4.6, based on an approved jurisdictional determination of the waters of the U.S. by the USACE on July 1, 2011, the Proposed Project will not impact jurisdictional waters within the solar facility boundary (Appendix K).

Clearing and grubbing activities for Proposed Project infrastructure (i.e., maintenance roads, perimeter road, perimeter fence, fire break, foundations for the transmission lines, collection lines, staging areas, water pipeline, and solar arrays) will avoid the six main drainages and the swale vegetation. The removal of vegetation could result in increased erosion and sedimentation, resulting in the degradation of water quality within the drainages. During construction and routine O&M, the use of maintenance and access roads that cross desert washes could affect drainages by crushing vegetation and increasing erosion. The use of vehicles and equipment to cross these washes could also result in degradation of water quality from the potential introduction of hazardous materials such as fuels and oils.

If the drainages within the solar facility boundary cannot be avoided, adverse impacts would be both short- and long-term. The Applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.

### 4.5.4. Residual Effects

Residual effects on water resources or hydrology resulting from implementation of the Proposed Project or alternatives include: (1) a reduction in groundwater availability for other uses in the Basin, (2) localized increases in sedimentation and scour in Proposed Project drainages, (3) a higher volume of concentrated storm water due to drainage structures, and (4) a potentially higher flood hazard, particularly due to loss of vegetative cover. For groundwater impacts, as stated in Section 3.4, the estimated yield of the California Wash Groundwater Basin is around 2,200 AFY and the Proposed Project water demand is only approximately 72 AFY. This amounts to about only 3% of the basin yield.

## 4.6. Air Quality

This section discusses effects on existing air quality that may occur with construction, operation, and decommissioning of the Proposed Project.

During the process of construction, operation, and decommissioning of the Proposed Project, emissions of regulated air pollutants from specific types of area sources (i.e., fugitive dust and mobile source fuel combustion) will affect air quality. However, these impacts are anticipated to be below thresholds that define any noticeable change to air quality or the local/regional climate. Air emissions associated with the proposed construction, operation, and decommissioning of the Proposed Project will be primarily short-term and mainly associated with engine exhaust due to combustion of fossil fuel in construction equipment and fugitive dust during construction. Relatively less significant contributions to air emissions would be generated due to on-road travel of vehicles for workers' commutes and delivery of materials and equipment to the Proposed Project's construction site. It is expected that a similar scale of air emissions would occur during the Proposed Project's decommissioning phase. Emissions of regulated air pollutants during the operational phase will primarily result from on-road travel of vehicles for workers' commutes and delivery of materials/equipment to the site to support operations and will be significantly less than the construction and decommissioning phase.

If there are no other potential sources of emissions other than fugitive PM emissions from construction activities and fugitive dust emissions from unpaved and paved roads that support the Proposed Project then the Applicant would not be required to obtain a New Source Review (NSR) permit prior to commencing construction of the Proposed Project on tribal land in Region 9 (Cheryl Nelson, pers. comm., July 27, 2011).

For new sources evaluating whether or not a NSR permit is required, the applicability test requires that sources estimate their potential to emit each of the regulated NSR pollutants. In making this estimation, only sources that belong to one of 28 source categories listed pursuant to section 302(j) of the Clean Air Act are required to include fugitive emissions to the extent that they are quantifiable (40 CFR 49.153 (a)(1)). These source categories are codified in 40 CFR 52.21(b)(1)(i)(a). None of these listed source categories include solar panel arrays. Therefore, because this facility is not one of the source categories that would be required to include fugitive emissions in its applicability determination, and because there do not appear to be any other emissions that would otherwise trigger NSR review; no NSR permit would be required.

Construction of the Proposed Project would take approximately four to five years to complete and would generate emissions of the following regulated criteria air pollutants, CO, NOx, VOCs, $SO_2$, $PM_{10}$ and $PM_{2.5}$. Ozone is not emitted directly from emission sources, but is created in the atmosphere via a chemical reaction between NOx and VOCs in the presence of sunlight; these compounds are referred to as ozone precursors.

Table 4-1 below presents estimates of total regulated air pollutant emissions during the construction phase, including major construction activities. Actual emissions can be expected to be reasonably lower than the emissions listed in this table. Calculations and supporting documentation of the Proposed Project's construction phase emissions are included in Appendix I.

**Table 4-1.**
**Total Regulated Air Pollutant Emission Estimates (5-Year Construction Phase)**

| Total Emissions (tons) | | | | | | GHG Total Emissions | | |
|---|---|---|---|---|---|---|---|---|
| VOCs | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $CO_2e$ |
| 50.0 | 239.0 | 423 | 3.9 | 161.0 | 71.0 | 53,269.3 | 1.9 | 53,309.3 |

Notes: Construction phase defined as 2012 through 2016.

Table 4-2 presents estimated annual emissions of criteria air pollutants and greenhouse gases (GHGs) anticipated to be generated during the operational phase of the Proposed Project on an annual basis.

### Table 4-2.
### Summary of Regulated Air Pollutant Emission Estimates (Operational Phase)

| Emissions (tons/year) | | | | | | GHG Total Emissions | | | |
|---|---|---|---|---|---|---|---|---|---|
| VOCs | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $SF_6$ | $CO_2e$ |
| 2.5 | 57.5 | 40.1 | 0.03 | 0.7 | 0.5 | 1,788.0 | 0.03 | 0.001 | 1,819.6 |

For purposes of the EIS, it was conservatively assumed that the Proposed Project would have an expected life span of 50 years, after which the applicant would either upgrade or decommission the facility. If the site is decommissioned, the Proposed Project components that are no longer needed would be removed from the site and recycled, when feasible. The activities involved in the facility closure would depend on the expected future use of the site. Certain facilities equipment might be retained for future uses, such as the O&M building, electrical transmission lines, and roads. Therefore, the extent of site closure activities would be determined at the time of closure. A conservative estimate of the amount of regulated air pollutant emission rates associated with the decommissioning phase is presented in Table 4-3. The detailed calculations and supporting documentation for the operational and decommissioning phases are also provided in Appendix I.

### Table 4-3.
### Summary of Regulated Air Pollutant Emission Estimates (Decommissioning Phase)

| Emissions (tons) | | | | | | GHG Total Emissions | | |
|---|---|---|---|---|---|---|---|---|
| VOCs | CO | NOx | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $CO_2e$ |
| 2.7 | 25.1 | 28.8 | 0.4 | 28.9 | 6.3 | 3,015.6 | 0.03 | 3,016.2 |

## 4.6.1. Indicators

**Air Quality**

A Proposed Project could affect air quality if it would:

- Violate any air quality standard or contribute substantially to an existing or proposed projected air quality violation, result in a cumulatively considerable net increase of any criteria pollutant for which the Proposed Project region is in non-attainment under an applicable federal or state ambient air quality standard, or Expose sensitive receptors to substantial pollutant concentrations.

The Proposed Project is not anticipated to cause any of the affects outlined above.

**Climate Change / Greenhouse Gases**

Environmental analysis and documents produced in the NEPA process should provide the decision-maker with relevant and timely information about the environmental effects of the decision and reasonable alternatives to mitigate these impacts. In this context, climate change issues arise in relation to the consideration of (1) the effects of GHG emissions from a Proposed Project and alternatives related to that Proposed Project and (2) the relationship of climate change effects to a Proposed Project or Proposed Project alternatives, including the relationship to proposal design, environmental impacts, mitigation, and adaptation measures. Effects of GHG emissions from the Proposed Project and alternatives are presented in the analysis in Section 4.2.1; effects of climate change from current conditions are discussed in Section 3, Climate Change. This type of Proposed Project is anticipated to have a positive effect on climate change.

EPA has recently determined through promulgation of the Tailoring Rule that any Proposed Project that increases GHG emissions by more than 75,000 tons per year on a $CO_2$ equivalent basis would be required to include GHG emission requirements in their permit. As discussed previously, the Proposed Project's annual emissions of GHG emissions during all three phases will be substantially less than the significant threshold of 75,000 $CO_2e$ tons/year.

### 4.6.2. Direct and Indirect Effects by Alternative

**Proposed Project**

**Construction and Decommissioning**

Exhaust and fugitive dust emissions generated from construction equipment and mobile sources would increase ambient concentration of regulated air pollutants. Wind-driven emissions of fugitive dust would be generated following disturbances by construction activities, including mobile sources traveling on paved and unpaved roadway surfaces. Soil-derived particles can obstruct visibility, cause property damage, and/or contribute to violations of air quality standards for fine particles if not properly managed. However, these emissions of engine exhaust and fugitive dust are not expected to contribute to local or regional exceedances of criteria air pollutant NAAQS for which the areas have been designated as non-attainment. The Proposed Project will implement BMPs to minimize the resultant impacts to local and regional air quality. The Proposed Project is located within HA 218 (California Wash). It is also assumed that vehicle traffic associated with Proposed Project construction would occur on I-15 between the Proposed Project and Las

Vegas, Nevada. In addition to HA 218, this section of I-15 would also pass through HA 212 (Las Vegas Valley) and 216 (Garnet Valley). The attainment status for the Proposed Project is show in Table 4-4.

### Table 4-4.
### Attainment Status for Proposed Site Location

| Pollutant | Hydrographic Area 212 | Hydrographic Area 216 | Hydrographic Area 218 |
|---|---|---|---|
| $O_3$ | Non-Attainment | Non-Attainment | Non-Attainment* |
| CO | Maintenance | Attainment | Attainment |
| NOx | Attainment | Attainment | Attainment |
| $SO_2$ | Attainment | Attainment | Attainment |
| $PM_{10}$ | Non-Attainment | Attainment | Attainment |
| $PM_{2.5}$ | Attainment | Attainment | Attainment |

Note: *Non-attainment area for HA 218 excludes the Moapa River Indian Reservation; the proposed site will be located within the Reservation.

The construction phase of the Proposed Project would temporarily cause fugitive dust related to grading and other construction activities. To comply with Clark County dust control requirements, the applicant would use best management practices (i.e., water) for dust control. Currently, only water is approved for dust control within potential threatened and endangered (T&E) species habitat. Any application of palliative or other dust reducing agent other than water must first be approved by regulatory authorities. The Proposed Project would implement the following BMPs for fugitive dust and wind erosion control:

- Minimize grading and vegetation removal, and limit surface disturbance during construction to the time just before module support structure installation;
- Limit vehicular speeds on non-paved roads (Clark County ordinance speed limit is 25 miles per hour);
- Apply water to disturbed soil areas of the Proposed Project to control dust and to maintain moisture level at optimum levels for compaction, as needed. Water will be applied using water trucks. To prevent runoff and ponding, water application rates will be minimized;

- Cover exposed stockpiled material areas during windy conditions (forecast or actual wind conditions of approximately 25 miles per hour or greater), apply dust control measures to haul roads to adequately control wind erosion;
- During periods of high wind, suspend excavation and grading;
- Cover all trucks hauling soil and other loose material or maintain at least 2 feet of freeboard; and
- All paved roads would be kept clean of objectionable amounts of mud, dirt, or debris, as necessary. Gravel or other similar material would be used where dirt access roads intersect the paved roadways to prevent mud and dirt track-out.

The estimated yearly construction and decommissioning emissions totals for $O_3$ precursors (NOx and VOCs) would be less than the de minimis thresholds as specified under the Federal General Conformity Rule (40 CFR 93); thus, Proposed Project-related emissions are assumed to conform to the SIP and the regional air quality plans. A comparison of Proposed Project-related emissions to General Conformity de minimis thresholds is presented in Tables 4-5 and 4-6. It should be noted that construction activities for the years 2012 through 2016 represent worst-case estimates based on the maximum number of mobile sources associated with the Proposed Project. The actual numbers of mobile sources should vary annually and should be well below the maximum mobile source volumes evaluated. Detailed emission calculations and supporting documentation are included in Appendix I.

### Table 4-5.
### Comparison of Proposed Project Emissions in Ozone Nonattainment Area to General Conformity De Minimis Thresholds

| Activity | NOx Emissions (tons/yr) | VOC Emissions (tons/yr) |
|---|---|---|
| Construction Activities 2012 | 47.0 | 5.6 |
| Construction Activities 2013 | 94.0 | 11.1 |
| Construction Activities 2014 | 94.0 | 11.1 |
| Construction Activities 2015 | 94.0 | 11.1 |
| Construction Activities 2016 | 94.0 | 11.1 |
| Operational Activities | 40.1 | 2.5 |
| Decommissioning Activities | 28.8 | 2.7 |
| **General Conformity De Minimis Thresholds** | **100** | **100** |

### Table 4-6.
### Comparison of Proposed Project Emissions in CO and $PM_{10}$ Nonattainment Area (Las Vegas Valley) to General Conformity De Minimis Thresholds

| Activity | CO Emissions (tons/yr) | $PM_{10}$ Emissions (tons/yr) |
|---|---|---|
| Construction Activities 2012 | 26.5 | 18.0 |
| Construction Activities 2013 | 53.1 | 35.9 |
| Construction Activities 2014 | 53.1 | 35.9 |
| Construction Activities 2015 | 53.1 | 35.9 |
| Construction Activities 2016 | 53.1 | 35.9 |
| Operational Activities | 57.5 | 0.7 |
| Decommissioning Activities | 25.1 | 28.9 |
| **General Conformity De Minimis Thresholds** | **100** | **70** |

### Operations

During its operational phase, the Proposed Project would generate emissions of regulated air pollutants associated with exhaust from the emergency fire pump, mobile combustion emissions from worker commutes and delivery trips, and limited fugitive dust from inspection and maintenance vehicles traveling on unpaved roads. The actual production of electricity from the solar panels does not create emissions.

The Proposed Project would require an operational workforce including 35 full-time equivalent (FTE) positions. This workforce would include administrative and management personnel, operators, and security and maintenance personnel. O&M would require the use of vehicles and equipment including trucks for on-site security/work and panel washing, and all-terrain vehicles for minor equipment maintenance. Additional maintenance equipment would include forklifts, bobcats, and water trucks for general lifting, periodic site grading and daily dust control, respectively. Water trucks would be used to support periodic dust control activities and pick-up trucks would sometimes be in use on the Proposed Project.

Ongoing emissions of regulated air pollutants associated with operation of the proposed facility would be relatively minor over the duration of its operational phase (i.e,. long-term effect). There would be no large combustion sources on-site. Fugitive dust emissions would continue from O&M vehicles traveling on the gravel roads. During

Proposed Project operation, dust management needs would be minimal as fugitive dust-generating activities such as vehicle traffic are limited. Vehicular traffic during operations is primarily related to periodic inspections and repairs to equipment. Further, due to the solar panels' relatively fixed orientation and placement low to the ground, the panels themselves would shield the ground from prevailing winds. The surface soils would be less disturbed by windy conditions than if the panels were not present. Nonetheless, the following practices would be implemented, as necessary, to further reduce the potential for fugitive dust during plant operation:

- Vehicular speeds on non-paved roads and access ways would be limited;
- Regular inspections would be suspended during periods of high winds; and
- Water trucks would be used, as necessary, during specific meteorological events.

The estimated yearly emissions totals of $O_3$ precursors (NOx and VOCs) would be less than the de minimis thresholds as specified under the Federal General Conformity Rule (40 CFR 93); thus, Proposed Project related emissions during the operational phase are assumed to conform to the SIP and the regional air quality plans. A comparison of Proposed Project operation-related emissions to General Conformity de minimis thresholds is presented in Tables 4-5 and 4-6. Detailed emission calculations are included in Appendix I.

### Decommissioning

The types of emissions generated during decommissioning of the Proposed Project would be similar to those generated during Proposed Project construction. It is expected that decommissioning activities would result in lower emissions than for construction. A quantitative description of these emissions is provided in Table 4-3 and Appendix I. Effort and resultant emissions would be similar for construction and decommissioning; since air quality impacts from construction would not be significant, air quality impacts from decommissioning will also not be significant. The air quality impacts associated with Proposed Project construction and decommissioning would be temporary.

Disturbance of the site (e.g., grading or removal of vegetation) for the Proposed Project could have impacts through dust generation after the site is decommissioned. To ensure that decommissioning the facility would not have an adverse effect, the Facility Decommissioning Plan would be developed and provided to the regulatory authority and Tribe for approval at least six months prior to commencement of site closure activities. The Plan would address future land use, impacts, and mitigation associated with closure activities, the schedule of closure activities, equipment to remain on the site, and the conformance of the Plan to applicable regulatory requirements and resource plans. The Facility Decommissioning Plan would be consistent with requirements and goals set forth in the Site Restoration Plan. The extent of site closure activities would be determined at the time of closure, in accordance with the Facility Decommissioning Plan. Potential closure activities could include re-grading and restoration of original site contours and re-vegetation of areas disturbed by closure activities in accordance with the Site Restoration Plan.

### GHG Emissions

It should also be noted that long-term generation of renewable electricity through solar power could have long-term air quality benefits as part of regional and national goals to replace other forms of electricity production that may have much higher levels of air pollutant and GHG emissions. The actual change in regional or national air pollutant emissions attributable to a single project cannot be quantified.

The CEQ issued guidance on February 18th, 2010, which states that "if a proposed project would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of $CO_2$-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public" (CEQ 2010). CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs.

During construction, it is estimated that annual GHG emissions would be less than 12,000 metric tons of $CO_2e$ emitted from construction equipment and worker commute vehicles. Although the relative scale of these emissions would be extremely small when compared to state or national GHG emissions levels, the cumulative nature of other ongoing proposed projects in conjunction with the Proposed Project could contribute to an increase in emissions of GHGs. This impact is addressed further in the cumulative impact analysis. Ongoing operational emissions of GHGs are estimated to be less than 3,500 metric tons of $CO_2e$, and would, thus, not adversely affect levels of GHG emissions or hinder federal or state attempts to reduce GHG emissions levels. It is estimated that decommissioning would generate less than 3,200 tons of CO2e, and would, thus, not adversely affect emission levels of GHGs or hinder federal or state attempts to reduce GHG emissions levels.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

The impacts to air quality and GHGs would be similar to those of the Proposed Project. Impacts as a result of fugitive dust and equipment emissions would be decreased in the short term due to Phase 3 of the Proposed Project not being completed. The alternative up to 500kV transmission line would also be approximately 1-mile shorter in length and, therefore, reduce construction time. Long-term and operational air quality effects would be similar for Alternative I and the Proposed Project.

### No Action Alternative

The No Action Alternative assumes that the lease agreement is denied and the Proposed Project is not allowed to be constructed and operated. Under this alternative, there would be no construction or operational emissions; thus, there would be no direct or indirect effects on air quality or climate change. Since the solar plant is considered a renewable energy source, not constructing the Proposed Project may result in the generation of electricity through traditional electrical generation from fossil fuels and be considered an adverse, indirect affect.

### 4.6.3. Residual Effects

All air quality and GHG impacts were assessed as if all Applicant-proposed mitigation measures, BMPs, and other design features of the alternatives have been applied. Therefore, there is no difference between residual effects and Proposed Project impacts, as discussed above.

## 4.7. Noise

### 4.7.1. Noise

This section discusses the effects on the ambient noise and vibration levels that may occur with implementation of the Proposed Project or alternatives. The indicators used to identify and analyze effects are presented and potential effects and agency-recommended mitigation measures are discussed.

### 4.7.2. Indicators

The primary indicator of noise levels for this analysis is the A-weighted average noise level measured in decibels ($L_{eq}$). The one-hour average noise level (dBA $L_{eq}$ [1-hour]) is often used to characterize ongoing operations or long-term effects. The maximum dBA level (dBA $L_{max}$) is used to document the highest intensity, short-term noise level. Another commonly used measure of noise effects is $L_{dn}$. The $L_{dn}$ value is a 24-hour A-weighted sound level average calculated from midnight to midnight, where sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting.

The BIA and the BLM do not have regulations quantitatively limiting noise generation or effects from the Proposed Project during the temporary construction phases or operational phase. The EPA has developed and published a criterion to be used as an acceptable guideline when no other local, tribal, county, or state standard has been established (USEPA 1974).

The Proposed Project would affect ambient noise and vibration levels if it would:

- Result in the generation of noise levels or exposure of persons and sensitive species to noise levels or ground-borne vibration and noise levels in excess of standards established in applicable federal, state, and local general plans or noise ordinances at nearby noise-sensitive areas

### 4.7.3. Direct and Indirect Effects by Alternatives

This section describes effects under each alternative following the requirements described under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource.

Effects on the existing ambient noise and vibration levels may arise from Proposed Project construction, operation and maintenance, and decommissioning equipment.

#### The Proposed Project

Effects that could result from the implementation of Proposed Project during construction, O&M, and decommissioning activities are analyzed in the discussion below.

**Short Term**. The construction phase of the Proposed Project is expected to last up to 60 months, spanning a period from the first quarter of 2012 to the fourth quarter of 2016. The Proposed Project is scheduled to be constructed in three phases. Phase 1 would consist of the construction and operation of an approximate 100-150 MW solar plant including all associated facilities (access road, 500kV transmission line, onsite substation, O&M building, water pipeline, 12kV transmission line, and facility access roads). Phases 2 and 3 would include construction and operation of the remaining facility and associated features in approximate 100 – 150 MW sections. During peak construction activity, the Proposed Project would require approximately 400 workers. Across the entire construction phase, the average workforce is expected to number approximately 250-300 workers.

Construction: To evaluate potential noise impacts due to Proposed Project construction, reference noise levels were obtained from the Construction Noise Handbook (Federal Highway Administration [FHWA] 2006) which provides a comprehensive assessment of noise levels from construction equipment. Based on the reference values in the guide and the list of construction equipment to be used on the Proposed Project, presented in Table 4-7, the loudest equipment would generally emit noise in the range of 80 to 85 dBA at 50 feet, with utilization factors of 16 to 50 percent that account for the time period the equipment would be used during a 10-hour work day. Noise at any specific receptor is typically dominated by the closest and loudest equipment. The type of construction equipment and the number of equipment pieces near any specific receptor location would vary over time.

## Table 4-7.
## Typical Construction Equipment Noise Levels

| Equipment | Typical Utilization Factor (%) | Noise Level (dBA) at 50 feet |
|---|---|---|
| Backhoe | 40 | 80 |
| Concrete mixer truck | 40 | 85 |
| Concrete pump truck | 20 | 82 |
| Crane | 16 | 85 |
| Drill rig | 20 | 85 |
| Dozer | 40 | 85 |
| Excavator | 40 | 85 |
| Generator | 50 | 82 |
| Grader | 40 | 85 |
| Loader | 40 | 80 |
| Paver | 50 | 85 |
| Roller | 20 | 85 |
| Heavy truck | 40 | 84 |
| Tractor | 40 | 84 |

Source: FHWA, 2006

For the purpose of this analysis, construction noise impacts are evaluated under "worst-case" conditions as described by the Proposed Project grading scenario and the electrical transmission line installation scenario. The specified equipment and their respective utilization factors were evaluated for each scenario. The noise impact assessment assumed that construction equipment would operate between the hours of 7:00 a.m. and 5:00 p.m., Monday through Saturday.

As shown above in Table 4-7, the maximum intermittent construction equipment noise levels are expected to range between 80 and 85 dBA at approximately 50 feet. Based on construction noise modeling, the highest predicted and combined operational noise level for construction equipment associated with the Proposed Project would be 86.3 dBA at 50 feet from the grading operations and 84.4 dBA during the installation of the transmission line. Given the two temporary worst-case construction scenarios defined above, the construction equipment noise levels at various distances are presented in Table 4-8.

### Table 4-8:
### Construction Equipment Noise Levels versus Distance

| Distance from Property Line | Grading Noise Impact Level ($L_{eq}$ dBA) | Transmission Noise Impact Level ($L_{eq}$ dBA) |
|---|---|---|
| 50 | 86.3 | 84.4 |
| 100 | 83.0 | 79.2 |
| 200 | 78.2 | 72.8 |
| 400 | 74.3 | 68.2 |
| 800 | 68.7 | 61.9 |
| 1,600 | 62.2 | 55.1 |
| 3,200 | 54.6 | 47.4 |
| 6,400 | 45.2 | 37.9 |

Source: ARCADIS

Although actual, combined noise levels from construction activities would depend on the duration of each task and the exact number and utilization factor of each piece of equipment and vehicle, it is estimated that construction activities would produce a short-term, adverse increase over the existing ambient noise levels at the site boundary of the Proposed Project (50 feet from the source). In addition, the use of percussive or vibratory equipment during the installation of the solar arrays may produce short-term, ground-borne vibration (above 75 VdB) and groundborne noise within the vicinity of the Proposed Project. These noise and vibration levels would be attenuated to below existing ambient noise levels by the time they reached the closest residence (approximately 10 miles north from the site); thus, they will be inaudible at the closest sensitive receptor. The noise impacts to the nearest sensitive human receptor will not exceed the EPA noise threshold limit of 55 dBA $L_{dn}$ (48 dBA $L_{eq}$). There are no sensitive human receptors that will be adversely impacted by the construction of the Proposed Project or the transmission line. Therefore, no mitigation is required to reduce construction related noise and vibration impacts.

Other sensitive land uses, such as recreational and special management areas, may be affected by a short-term increase of noise levels. Effects on recreational users may be detectable along the Off-Highway Vehicle (OHV) routes but would be short-term and unlikely to impair the recreational resource. The Proposed Project would not cross any designated ACECs. Therefore, no measurable change would be detected from current conditions, resulting in no effect from construction on sensitive land uses.

Short term impacts could result to wildlife species such as birds and small mammals; however, the area within the fenced solar facility would be void of sensitive or listed species. Impacts to vegetation and presence of humans and machinery would deter most wildlife from within the solar facility and therefore noise impacts to wildlife would be focused upon species adjacent to the facility. Given the location of the facility upon the mesa and the presence of a 20-feet wide firebreak around the perimeter it is assumed that only short term impacts would occur from noise and vibration during the construction phase. Most non-listed wildlife species would return to the area after construction if significant habitat and foraging opportunity exists.

**Long Term.** During the operational phase, the Proposed Project is expected to employ up to 35 permanent workers to operate and maintain the facility and to provide plant security.

Proposed Project operations would be completely automated. The various power components would be turned on and off automatically in the morning and evening, respectively. Electrical power components that would be operated include solar field direct current (DC) electrical collector systems, DC to alternating current (AC) inverters and step-up transformers, a new substation, tie-in infrastructure at the existing Crystal substation, 12 kV transmission line, and up to 500 kV transmission line.

Permanent staff would include a nightly security officer. Maintenance needs would include panel washing (twice per year), array visual and infrared inspection, vegetation control (as needed), and inverter and switchyard maintenance. The equipment would also include the use of all-terrain vehicles to travel inside the solar facility for physical inspection and parts replacement.

The potential sources of long-term operational noise would stem from the operation of electrical equipment including the transformers for the solar arrays, corona noise from the 12kV and 500kV transmission lines, the solar facility substation, the existing Crystal substation, and noise from vehicle operations during routine O&M.

Noise from electrical equipment, such as transformers, is characterized as a discrete low frequency hum (Bell and Bell 1994). Among this type of equipment, transformers would be expected to contribute the most to composite noise at the site. The noise from transformers is produced by alternating current flux in the core that causes it to vibrate (an effect also known as magnetostriction). In addition, transformer cooling fans produce noise when they operate. This noise is produced at a frequency (Hertz [Hz]) of twice the reference line (i.e., 2 x 60 Hz = 120 Hz), which can propagate with favorable weather conditions over long distances with little potential for reduction and create disturbances for residential receptors located at distances of 3,000 to 10,000 feet (Elliot *et al.* 1998).

The relative loudness of transformers depends on their particular construction design and operational design technique, as well as the ambient noise levels at a site (Jefferson Electric 2010). The Proposed Project equipment would include a total of 175 2,500 KVA transformers and up to three 167 MVA transformers. The National Electrical Manufacturers Association (NEMA) standard describes sound levels of 2,000kVA commercial transformers (e.g., vent-dry type) at a distance of one foot from the source to be 66 dBA for self-cooled and 71 dBA for fan-cooled units (General Electric 1999). The composite noise level from identical sources—which can be predicted based on the final design, location, and technical specifications—would add three dB's per identical transformer. This sound level is equivalent to a household vacuum cleaner at 10-feet. The transformer locations are spread widely over the site, which would additionally reduce the composite noise level at a receptor. The closest distance from a transformer to a sensitive noise receptor is approximately 10 miles. The combined noise level of 178 transformers in use during Proposed Project operations shall be inaudible at the nearest residential receptor, and shall not exceed the EPA noise threshold of 55 dBA $L_{dn}$ (48 dBA $L_{eq}$), which is the level considered acceptable for outdoor use areas in which human activity takes place.

Other maintenance activities, such as visual inspections, vegetation mowing, and equipment parts replacement, would be expected to be ongoing over the life of the Proposed Project. Potential effects from these activities on the existing ambient noise levels may be detectable for a short duration at the site and on local roads (minor increase in traffic). Given the relative location of the site with respect to sensitive receptors, any potential increases in noise levels on-site are unlikely to be detectable or of concern to the general public. Therefore, there would be no long-term effects on existing ambient noise and vibration levels at the nearest residential sensitive receptor from O&M of the Proposed Project. No additional mitigation has been identified.

When a transmission line is in operation, an electric field is generated in the air surrounding the conductors forming a "corona." The corona is an event that results from the partial breakdown of the electrical insulating properties of the air surrounding the conductors. When the intensity of the electric field at the surface of the conductor exceeds the insulating strength of the surrounding air, a corona discharge occurs at the conductor surface, representing a small dissipation of heat and energy. Some of the energy may dissipate in the form of small local pressure changes that result in audible noise or in radio or television interference. Audible noise generated by corona discharge is characterized as a hissing or crackling sound that may be accompanied by a 120 hertz hum.

Slight irregularities or water droplets on the conductor and/or insulator surface accentuate the electric field strength near the conductor surface, thereby making corona discharge and the associated audible noise more likely. Therefore, audible noise from transmission lines is generally a foul-weather (wet conductor) phenomenon. However, during fair weather, insects and dust on the conductors can also serve as sources of corona discharge.

The Electric Power Research Institute (EPRI) has conducted several studies of corona effects (EPRI 1978 and 1987). Typical noise levels of transmission lines with wet conductors are shown in Table 4-9, Transmission Line Voltage and Audible Noise Level.

### Table 4-9.
### Transmission Line Voltage and Audible Noise Level

| Line Voltage (kV) | Audible Noise Level Directly Below the Conductor (dBA) |
|---|---|
| 138 | 33.5 |
| 240 | 40.4 |
| 356 | 51.0 |

Source: EPRI, 1978 and 1987
kV = kiloVolt; dBA = A-weighted decibels

As the Proposed Project transmission lines could be 500 kV, operation of the lines can be predicted to generate more than 51.0 dBA based on the noise levels described in Table 4-9. A noise level of this magnitude would generally be indistinguishable from background ambient noise within the existing environment of the nearest sensitive receptor, even during the nighttime hours. Therefore, operation of the Proposed Project transmission lines would have a negligible effect on existing ambient noise level at the nearest residential sensitive receptor. No mitigation is required.

Maintenance activities associated with the transmission line, substation, transformers, and solar arrays would typically result in noise levels below those associated with construction-related activities, and are anticipated to involve fewer pieces of heavy equipment, occur less frequently, and be of shorter duration than construction activities. Maintenance activities are primarily inspection-related (for example, annual inspection of the transmission line from vehicles). Other maintenance activities, including washing of insulators to ensure proper function, would be conducted on an as-needed basis, but are anticipated to occur less than once per year. Due to the short duration of these maintenance activities, and the distance to the nearest sensitive receptor, there will be no long-term adverse effect on the existing ambient noise conditions. Therefore, no mitigation is required.

Decommissioning. The expected life of the Proposed Project is 50 years. According to the Applicant, in the event that the site should be removed from power generation service, it would be made suitable for reclamation. All equipment, buildings, concrete foundations, and driven piles would be removed from the site, generating a temporary and localized increase in ambient noise levels during decommissioning. The Applicant would develop a Facility Decommissioning Plan consistent with BIA and Tribal requirements in a manner that protects public health and safety and is environmentally acceptable. Adverse effects during decommissioning would be localized and short-term. No mitigation would be required due to the distance to the nearest sensitive receptor.

#### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

The Alternative I components, construction techniques, and design features are the same as the Proposed Project. The solar arrays, substation, and operations building and parking would be contained within an approximately 1,550 acre footprint; the transmission line corridor would be approximately 1-mile shorter and the water pipeline and 12kV transmission line impacts would be similar. Noise sources would be located a similar distance from all sensitive noise receptors as for the Proposed Project. Noise impacts from the construction and operation of Alternative I would be less than the Proposed Project only in the short term given a lesser construction time. Therefore, no additional mitigation would be required.

#### No Action Alternative

Under this alternative, there would be no construction; therefore, there would be no noise effects to the sensitive receptors.

### 4.7.4. Residual Effects

There would be no residual effects from construction, O&M, and decommissioning of the alternatives.

## 4.8. Biological Resources

This section discusses effects on biological resources that may occur with implementation of the Proposed Project or alternatives. This section is divided into several subsections by resource: vegetation, wildlife, and sensitive wildlife species. This section describes effects under each alternative following the requirements described under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Effects on biological resources that could result from the implementation of the alternatives during construction, O&M, or decommissioning activities associated with the Alternatives are analyzed in this section.

### Methodology

Analysis of impacts to biological resources was conducted by: (1) using information from numerous sources and historical reports in addition to data provided by the Applicant and the Tribe; and (2) evaluating temporal and spatial impacts to habitats and organisms potentially present within the Proposed Project and within a regional geographic context.

The Applicant conducted a desert tortoise survey and botanical reconnaissance of the Proposed Project during October 2010 and during multiple site visits in spring 2011. The botanical inventory documented and quantified the presence/absence of special status plant species within the Proposed Project. The results of this study have been used in this analysis to assess potential vegetation impacts including impacts to special status plant species within the Proposed Project. The desert tortoise survey will be used to prepare a Biological Assessment and act as the Section 7 consultation document between the BIA and USFWS.

## 4.8.1. Indicators – Biological Resources

The Proposed Project would affect biological resources if it would:

- Substantially alter the structure, function, and persistence of sensitive upland, riparian, or aquatic vegetative communities;
- Change the diversity or substantially alter the numbers of a local population of any wildlife or plant species, or interfere with the survival, growth, or reproduction of affected wildlife and plant populations;
- Substantially interfere with the seasonal or daily movement, migration corridors, or range of migratory birds and other wildlife;
- Result in a substantial long-term habitat loss, degradation, fragmentation, or substantial increase in the edge-to-volume ratio of key habitat of special status species;
- Result in direct or indirect impacts on candidate or special status species populations or habitat that would contribute to or result in the federal or state listing of the species (e.g., substantially reducing species numbers, or resulting in the permanent loss of habitat essential for the continued existence of a species);
- Introduce and/or increase the potential for introduction of invasive, non-native plants or noxious weeds to an area or potential increase in existing populations of these plants;
- Introduce physical structures or involve production, use, or disposal of materials that pose a health hazard to special status species;
- Result in changes in the environment that increase opportunities for predators of special status species; or
- Result in water use, water developments, or water controls that impact native vegetation, special status plant species, or habitat of special status plant species.

## 4.8.2. Vegetation

The general ecological setting of the Proposed Project is consistent with Mojave Desert scrub. The area is dominated by open stands of creosote bush and white bursage. Desert saltbush scrub habitat and cactus-yucca scrub are also present. Cacti species observed during the biological surveys were the barrel cactus, beavertail cactus, cottontop cactus, hedgehog cactus, pencil cholla, silver cholla, and teddybear cholla.

A number of grass and bush species are found throughout the Proposed Project site including Arabic grass, snake weed, desert trumpet, desert grass, Indian rice-grass, big galleta and buckwheat. Catclaw and winged saltbush were also identified.

Desert wash portions of the Proposed Project support taller and more vigorous specimens of species found throughout the site. Implementation of the Proposed Project would affect all forms of vegetation on and surrounding the site. Direct and indirect effects, cumulative effects, mitigation, and residual effects to vegetation resources are discussed below.

### 4.8.2.1. Direct and Indirect Effects by Alternatives – Vegetation

The Applicant conducted a botanical reconnaissance and desktop evaluation in early 2010 and an on-the-ground botanical inventory of the Proposed Project during October 2010 and in spring 2011. The botanical inventory documented and quantified the presence/absence of special status plant species within the Proposed Project. The results of this study have been used in this analysis to assess the potential vegetation impacts including impacts to special status plant species within the Proposed Project. No additional botanical surveys were completed.

#### The Proposed Project

Clearing, tilling, and other ground-disturbing activities for the Proposed Project's infrastructure would cause the direct loss of vegetation within the Proposed Project. The vegetation community that would be affected is primarily Mojave creosote bush-white bursage scrub. Some of the disturbance would be permanent; thus, vegetation would be permanently impacted for those portions of the Proposed Project. Permanent impacts, or impacts that would remain for 50 plus years, would occur to a majority of all the vegetation located within the perimeter fence as a result of leveling, scraping, tilling and drum rolling as required for infrastructure. The vegetation within the perimeter fence would be allowed to naturally re-colonize in areas not covered by infrastructure; however, any existing or new vegetation would be managed to a height of no more than 12 inches through conventional mowing. Cacti and yucca will be relocated at the direction of the Tribe and in accordance with the Biological Opinion prior to construction activities. The Applicant would incorporate an approved Weed Management Plan to control the growth of weeds and other undesired vegetation.

Mowing would result in the loss of a percentage of each plant's biomass and the nutrient and carbohydrate stores contained within the lost biomass. Mowing would result in the direct mortality of some plant species, while the surviving plants would respond to the mowing by using energy stored in root systems to replace the lost stems. The continual mowing activities during the operation of the Proposed Project could lead to the direct mortality of the remaining plant individuals, as each period of attempted stem replacement by these plants following mowing would deplete energy stores within the plant and increase metabolic stress. Mowing could also result in the direct mortality or injury of existing plants, as the discarded biomass created by the mowing could damage, smother and/or shade the remaining vegetation. Mowing would also expose plant cut stems to infection from bacterial and fungal disease, which could result in mortality.

Permanent impacts would also occur as a result of the following Proposed Project infrastructure located outside of the perimeter fence: access roads, fire break, service road, electric transmission lines, and the water pipeline from the existing well.

Temporary disturbance would occur to vegetation located inside of the perimeter fence, including areas used for installation of temporary construction facilities, parking, equipment and materials staging, trenching of underground cables, drainage control berms, and free space within the solar arrays.

During the operation of the Proposed Project, continual use of mowing to manage local vegetation would cause a shift within the current composition of the local plant community. The composition of the plant community would favor those species that are more tolerant of continual disturbance from mowing. The selective pressure on plants from mowing during the operation phase would cause some plant species to decline and, perhaps, die out, while other species would tolerate the mowing and may even thrive under new conditions. This shift would likely favor the propagation of invasive weed species, while existing native plants would be least likely to tolerate this treatment.

Clearing, tilling, and other ground disturbing activities would disturb soil within the Proposed Project, thus creating opportunities for non-native, invasive weed species to colonize the disturbed work areas. Weed sources would include incoming vehicles, incoming fill, construction BMPs such as hay bales and adjacent lands via natural movement such as wind. Invasive weed species could out-compete native plants for resources such as water and space. Additionally, soil disturbance could reduce the native seed bank associated with the site. Dust generated during construction could adversely affect on-site and off-site native vegetation communities by reducing photosynthetic activity. Reduction of native plant species would leave denuded areas at risk for the potential spread of non-native, invasive weed species and increase the potential for increased erosion. The spread of non-native, invasive weeds would also occur during O&M activities that continuously denude and disturb the existing habitat. Typical O&M

activities include additional vehicle traffic due to monthly, quarterly, semi-annual, and annual inspections and service, the proposed quarter-annual washing of the PV panels, and road maintenance. The treatment of noxious/invasive weeds (i.e., herbicide treatments, plant removal) could result in inadvertent mortality and/or injury of the native plant species. Additional vehicles and crews could inadvertently track in clinging seeds and/or parts of noxious weeds. Spread of noxious weeds within the Proposed Project would also have the potential to impact the adjacent Reservation.

The Proposed Project would introduce added water to the site for dust control, soil compaction and stabilization, PV solar panel washing, and miscellaneous other maintenance uses. The Applicant estimates that a maximum of 72 AFY would be used on-site during the construction phase of the Proposed Project with an estimated 20 to 40 AFY used during operations. The majority of this operational water use would be used for PV panel washing. The Applicant estimates four (4) PV panel washings would be required each year, but would wash PV panels as frequently as needed. This sudden introduction of additional water inputs could directly impact the composition of the local plant community by providing a competitive advantage to those plant species that thrive in wetter conditions. The additional water source could also provide moisture for the germination of existing seeds. Invasive weed species could also benefit from the additional moisture, potentially out-competing the native vegetation that thrives under xeric conditions.

During construction, hazardous waste (solid and liquid) would be generated, all of which would be generated at the Proposed Project. Most of the hazardous waste generated during construction would consist of liquid waste, such as water from excavation dewatering (if it contains contaminants), fluids used for flushing, cleaning and passivating (to prepare pipes for use), solvent use, and potential small petroleum spills resulting from the operation of heavy equipment and the filling of transformer and hydraulic equipment reservoirs. Exposure to hazardous waste could result in the direct mortality of individuals in the natural vegetation community. O&M activities could also result in production of similar hazardous waste, as during the construction phase, and would result in the same types of impacts. Operations and maintenance activities would include the use of herbicide treatments to control invasive and noxious plants. The type of herbicide that would be applied will be outlined within the Applicant's Weed Management Plan that would be approved by the BIA, BLM and Tribe prior to the initiation of construction.

Proposed Project implementation would change the quantity, frequency, and location of sunlight reaching the ground beneath the solar arrays. Artificial shading caused by the PV solar panels could result in a decrease in photosynthesis and reduced soil and plant temperatures. These changes to the microhabitat underneath PV solar panels would result in a change to the composition of the natural plant community, as species that are better adapted to the new condition would have a competitive advantage over those species that are not as well-adapted. The changes to the microhabitat under the PV panels could create a more suitable habitat for the propagation of invasive species.

During operation of the Proposed Project, the drainage berms would transform physical topography and surface hydrology within Proposed Project. Surface hydrology and water inputs are controlling forces in the distribution of both native vegetation and special status plants. Under natural conditions, major precipitation events would produce flow dispersed among a network of small and large channels across the alluvial fans on-site. Drainage control berms would alter the distribution and quantity of surface water flows and the patterns of sediment deposition by surface water within the Proposed Project. Changes to the current hydrological regime would result in a change to the composition of the natural plant community, as species that are better adapted to the new conditions would have a competitive advantage over those species that are not as well adapted to the new conditions. Changes to hydrology and surface water flow could also facilitate weed seed dispersal. The new conditions might include new stormwater runoff patterns, lack of sheet flow, channelized site drainage and increase water availability as a result of panel washing.

Proposed Project facilities have an expected life of 50 years or more. The Applicant would develop a Site Restoration Plan for the revegetation and rehabilitation of areas disturbed by the Proposed Project. This plan would be implemented immediately after construction for the areas that are temporarily disturbed, such as portions of the transmission line route. At the present time, the future use of the site has not been determined; therefore, the Applicant has not determined the extent of site closure activities. Because the Facility Decommissioning Plan has not been developed at the time of this assessment, the identification of and assessment of the potential impacts cannot be completed at this time. However, activities related to the decommissioning of the Proposed Project would most likely be similar in nature to those activities occurring during the construction phase. Accordingly, then decommission activities would result in similar type of impacts to local vegetation species as is described for the construction phase of the Proposed Project.

Implementation of the Proposed Project as designed would result in adverse impacts on vegetation communities, specific cacti and yucca and individuals of special status plant species. These impacts would occur over both the short and long term (depending on whether the required ground disturbances were permanent or temporary) and localized to the footprint of the Proposed Project. Impacts also could be extensive due to the potential spread of introduced noxious and invasive plant species outside of the boundaries of the Proposed Project. To avoid and minimize the impacts, the following mitigation measures are recommended (see Chapter 5 Mitigation Measures - Biological Resources, for further specific details on the proposed mitigation measures):

- Pre-construction surveys;
- Best management practices;
- Biological monitors;
- Worker Environmental Awareness Program;
- Weed Management Plan; and
- Site Restoration Plan.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Alternative I would be constructed and operated similar to the Proposed Project, with the exception of completion of Phase 3 within the solar facility and a reduction in length of the proposed up to 500kV transmission line. Overall impacts to vegetation would be decreased by over 500 acres. Short- and long-term impacts to vegetation would occur as a result of construction, operations, and decommissioning activities similar to the Proposed Project.

### No Action Alternative

Under this alternative, there would be no construction; therefore, there would be no Project-related effects on vegetation resources.

### 4.8.2.2. Residual Effects – Vegetation

Subsequent to implementation of the mitigation measures, it is possible that noxious/invasive weeds could be introduced in the area after construction and during operations phases. The combination of continual mowing with the introduction of both artificial shading and additional water sources could result in conditions that would favor the propagation of noxious weeds. At this time, the site-specific Weed Management Plan has not been developed, so the specific measures that the Applicant would implement to control noxious/invasive species cannot be reviewed. There is also the potential for residual adverse effects to the native plant community. Mitigation measures would be implemented to restore vegetation within the temporary impacted areas; however, the native vegetation within the portions of the Proposed Project requiring periodic mowing may not be able to sustain itself.

Continual disturbance caused by mowing activities could result in the mortality of many individual plants that are able to colonize following the site preparation activities. Each mowing occurrence could result in the weakening/injury of individuals and lead to direct mortality of individuals. The proposed mowing regime may also reduce the ability of individual plants to propagate. Depending on the timing and frequency of mowing activities, native plants may not be able to produce flowers and/or seeds. At this time, the

Applicant has not estimated the expected frequency of mowing events and the impacts due to mowing cannot be fully determined.

## 4.8.3. Wildlife

Analysis of impacts on wildlife biological resources was conducted by: (1) using information from numerous sources in addition to historical Reservation proposed project data provided by the Applicant; and (2) evaluating temporal and spatial impacts to habitats and organisms potentially present within the Proposed Project and within a regional geographic context.

### 4.8.3.1. Direct and Indirect Effects by Alternatives – Wildlife

The Applicant conducted on-the-ground surveys for the presence of desert tortoise in October 2010. Results of this survey have been used to estimate the potential number of individual desert tortoises within the Proposed Project site. Mapping resources were consulted to determine the extent of impact from the Proposed Project on wildlife-related Special Management Areas (SMAs). Potential impacts and appropriate minimization and mitigation measures were discussed in-depth with the USFWS.

#### The Proposed Project

Clearing, tilling, and other ground-disturbing activities of the Proposed Project are potential sources of direct mortality and injury to wildlife. Collisions with equipment and vehicles can occur for slow-moving species, species that have subsurface burrows, or ground-nesting birds. Nesting birds, large mammals, and reptiles are very susceptible to visual and noise disturbances caused by the presence of humans and construction equipment, and the generation of dust. Such disturbances could cause wildlife to alter foraging and breeding behavior, and avoid suitable habitat (e.g., nesting birds may abandon nests due to these disturbances). Loss of burrows due to Proposed Project construction, ground vibration, or avoidance behavior would cause wildlife to search for and/or dig new burrows.

Wildlife would also be indirectly impacted. As previously discussed, clearing, tilling, and other ground-disturbing activities and/or mowing would remove and/or modify natural vegetation communities. These vegetation communities provide forage, shelter, and nesting opportunities to non-listed wildlife and multiple special status wildlife. The loss and degradation of approximately 1,800 acres of wildlife habitat would cause wildlife to rely more heavily on habitat in surrounding areas. The loss of these vegetation communities would result in an indirect adverse impact. Loss of access would result in the loss of foraging areas, shelter, and nesting opportunities to non-listed wildlife and multiple special status wildlife species.

Permanent fencing of 2,000 acres would greatly reduce access by wildlife to any native habitat within the fenced areas that would be able to re-establish and survive the mowing activities. The loss of access would cause wildlife to rely more heavily on habitat within the surrounding area due to the loss of foraging areas, shelter, and nesting opportunities.

Construction activities and O&M activities would have the potential to impact wildlife within the Reservation. Construction and operation of the Proposed Project could directly and adversely impact wildlife on the Reservation by causing wildlife to alter foraging and breeding behavior. For example, increased noise as a result of construction could result in wildlife avoiding the general area surrounding the Proposed Project.

Additionally, wildlife that could not access food resources within the fenced portions of the Proposed Project could add pressure on the food resources in adjacent areas. Clearing, tilling, and other ground-disturbing activities and mowing could increase the spread of noxious/invasive weeds, which could potentially out-compete existing annual vegetation which would indirectly and adversely affect the quality of wildlife habitat and forage.

The presence of Proposed Project infrastructure may also indirectly cause mortality to wildlife by increasing the risk of predation on certain species by native predators such as ravens and raptor species. The addition of electric transmission poles/towers could provide additional perching resources to ravens and raptor species, which could result in increased foraging activity of these species within the Proposed Project site. Construction and O&M of the Proposed Project would result in trash and debris that may attract predators such as ravens and coyotes.

The compaction of soils and the introduction of invasive plant species due to mowing, grading, and tilling during construction and O&M activities could result in direct adverse habitat loss over time. Introduced noxious and invasive plant species would potentially out-compete existing annual vegetation.

During construction, hazardous waste (solid and liquid) would be generated at the site. Most of the hazardous waste generated during construction would consist of liquid waste, such as water from excavation dewatering (if it contained contaminants); fluids used for flushing, cleaning, and passivating (to prepare pipes for use); solvent use; and potential small petroleum spills resulting from operation of heavy equipment and filling of transformer and hydraulic equipment reservoirs. Herbicides would also contribute to hazardous waste generation.

Exposure to hazardous waste could be a direct source of wildlife mortality and/or injury through the poisoning of individuals. Spills of hazardous waste could also indirectly adversely impact wildlife if the spill of the hazardous waste results in the loss of natural vegetation community. The loss of the natural vegetation communities would result in the loss of foraging areas, shelter, and nesting opportunities to non-listed wildlife and multiple special status wildlife. O&M activities could also result in production of similar hazardous waste as during the construction phase of the Proposed Project, and would result in the same type of impacts.

Proposed Project facilities have an expected life of 50 years or more. The Applicant would develop a Site Restoration Plan for the revegetation and rehabilitation of areas disturbed by the Proposed Project. This plan would be implemented immediately after construction in areas that are temporarily disturbed, such as portions of transmission lines and water pipeline route. At the present time, the future use of the site has not been determined; therefore, the Applicant has not determined the extent of site closure activities. Because the Facility Decommission Plan has not been developed at the time of this assessment, the identification and assessment of the potential impacts cannot be completed at this time. However, activities related to the decommissioning of the Proposed Project would most likely be similar in nature to those activities occurring during the construction phase of the Proposed Project; therefore, decommissioning activities would result in similar impacts to local population of wildlife species as those described for the construction phase of the Proposed Project.

The Applicant has incorporated the following engineered and best management practice measures to help avoid or reduce impacts on wildlife species:

- SWPPP (Erosion and Dust Control),
- SPCC Plan,
- Waste Management Plan,
- Weed Management Plan,
- Bird and Bat Conservation Strategy
- Restoration Plan and Facility Decommissioning Plan, and
- Environmental Clearances (Permits).

Implementation of the Proposed Project as designed, and including these measures, would minimize adverse impacts on wildlife species. These impacts would be both short- and long-term and would be localized to the Proposed Project. To further mitigate impacts, the following measures are recommended:

- Preconstruction survey,
- Best management practices,
- Biological monitors,
- Worker Environmental Awareness Program,
- Reduced night lighting,
- Turning off idling equipment,
- Installation of acoustic barriers,

- Proper maintenance and working order of equipment and vehicles,
- Construction equipment muffled,
- Proper installation of transformer equipment,
- Imported soils are free from contaminants before use on-site, and
- Scheduling site disturbing construction activities to avoid avian breeding and nesting seasons to comply with provisions of the MBTA.

**Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line**

Alternative I would be constructed and operated similar to the Proposed Project, with the exception of completion of Phase 3 within the solar facility and a reduction in length of the proposed up to 500kV transmission line. Overall direct impacts to wildlife would be decreased by over 500 acres. The alternative transmission line route would traverse an open area of desert between the existing utility corridor and the Union Pacific railroad / I-15 corridor. This would increase fragmentation of the southern portion of the Reservation as well as increase potential perching areas for predators. Predation on sensitive species could increase as temporary vegetation impacts are further extended into the desert. Impacts to wildlife as a result of Alternative I would be similar or potentially more harmful.

**No Action Alternative**

Under this alternative, there would be no construction; therefore, there would be no Project-related effects on wildlife resources.

#### 4.8.3.2. Residual Effects - Wildlife

There would be long-term residual effects to wildlife due to the construction of the Proposed Project. None of the recommended mitigation measures would reduce the loss of 2,000 acres of wildlife habitat due to construction of the Proposed Project. The majority of the wildlife habitat that would be lost is within the portion of the Proposed Project located within the solar facility boundary. The fence would surround 2,000 acres of wildlife habitat and would severely reduce the ability of most wildlife to access the fence area. Only wildlife small enough to fit through the fence holes or able to climb or fly over the fence would have access to the resources within the fenced portions of the Proposed Project. The loss of wildlife habitat would result in a loss of shelter, nesting habitat, and foraging sources for wildlife species and would result in the affected wildlife having to rely more heavily on habitat outside of the solar facility boundary.

The proposed mowing regime for the management of the vegetation would have a residual effect on wildlife. The continual mowing of the natural vegetation within the solar facility boundary could result in a change in the species composition of the vegetation community as species that are more tolerant of frequent mowing would out-compete less-tolerant species. This change in species composition of the vegetation community could result in a loss/increase of shelter, nesting habitat, and foraging sources and type for wildlife species.

### 4.8.4. Special Status Species

The previously discussed impacts due to construction, O&M, and decommission are all sources of potential adverse impacts to special status wildlife species. The 10 species listed under the Endangered Species Act (ESA) (1974), four candidates for listing under the ESA, and one species protected by the Bald and Golden Eagle Protection Act (BGEPA) that are the focus of this assessment include: 1 invertebrate, 1 reptile, 7 fish, 1 amphibian, 3 birds, and 1 plant species; species believe extirpated from Clark County were not included. All species except for the desert tortoise and Golden Eagle were considered to be not present on-site or no substantial habitat was present on-site. A detailed account can be found in the Biological Assessment prepared concurrently with this EIS (Appendix J).

In addition to the above, federally protected species, several state listed plant species and BLM special status plant species have potential to occur within the solar facility and within the proposed transmission ROWs. Surveys for these plants would be conducted prior to any construction of the Proposed Project by a BLM approved biologist. Impacts to documented plants would be avoided if practical or reduced through use of construction BMPs and habitat restoration. If impacts cannot be avoided then impacts would be mitigated through seed collections from affected populations and a potential sponsorship of each affected species via the Center for Plant Conservation imperiled plant collection.

#### 4.8.4.1. Direct and Indirect Effects by Alternatives – Special Status Species

#### The Proposed Project

#### Desert Tortoise

All desert tortoises found within the proposed solar facility boundary of the Proposed Project would be translocated in accordance with USFWS protocols. During the life of the Proposed Project, 2,153 acres of the desert habitat would be disturbed, of which 2,000 acres of desert tortoise habitat would be permanently lost due to the construction of the Proposed Project. Desert tortoises could be harmed or killed during ground-disturbing activities and as a result of vehicle travel on access roads during construction and operation of the facility. Proposed Project activities could result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment. Individual tortoises could be crushed or entombed in their burrows; disruption of tortoise behavior during construction or operation of facilities could occur due to noise or vibration from the heavy equipment; injury or mortality could occur from encounters with workers' or visitors' pets; and trash may attract desert tortoise predators such as ravens and coyotes. Desert tortoises may also be attracted to the construction area by application of water for dust control, placing them at higher risk of injury or mortality. Additionally, tortoises may take shelter under parked vehicles and incidental take may occur when the vehicle is moved. Desert tortoises could be harmed by inadvertent hazardous materials spills, including equipment fuel and hydraulic fluid leaks.

Installation of exclusionary fencing at the solar facility could result in take of desert tortoises due to equipment operation, potential removal of tortoise burrows, and subsequent tortoise relocation/translocation. Fencing would preclude desert tortoises from re-entering their home range or could separate individuals from their home range. The exclusionary fence may likely result in displacement stress that could result in loss of health, exposure, increased risk of predation, increased intra-specific competition, and death. Capturing, handling, and relocating or translocating desert tortoises from the Proposed Project after installation of the fencing would result in harassment and may also result in death or injury. This is particularly true if relocation/translocation methods are performed improperly, such as during extreme temperatures, or if tortoises void their bladders due to handling stress, leaving them susceptible to severe dehydration.

Relocation/translocation activities could adversely impact the existing tortoises located within the relocation/translocation site if tortoises infected with upper respiratory tract disease (URTD; e.g., *Mycoplasma agassizii*, *M. testudium*) are relocated/translocated. Once a tortoise is infected with *Mycoplasma*, it is a carrier for life, with recurrence of the disease at some point in the future, regardless of treatment (Jacobson 1992). The introduction or spread of URTD would result in the illness and mortality of infected individuals.

During construction, breaches in the solar field exclusionary fencing may occur; desert tortoises could pass through the barrier and be affected by project-related activities. If breaches occur, materials and equipment left behind following construction and maintenance activities may entrap or entangle desert tortoises, attract predators such as common ravens and coyotes, or provide shelter for desert tortoises, which, when removed, may result in displacement or injury of the tortoise. During operation, surface water flows could also undercut and compromise the desert tortoise fence and allow short-term access to desert tortoise and their predators until such time as repairs are made.

The proposed translocation site is located to the north of the Proposed Project, within the Reservation. During preliminary evaluations, the proposed translocation site (approximately 6,000 acres) was determined to have desert tortoise habitat of quality equivalent to that of the Proposed Project. The close proximity of the proposed translocation site to the Proposed Project would ensure that impacted desert tortoises were kept within the Northeastern Mojave Recovery Unit (USFWS 2008). The proposed translocation site was surveyed in October 2011 using probabilistic sampling within the boundaries of the site. An additional 5,000 acres of potential relocation areas (2,500 acres north and south of the mesa adjacent to I-15) was surveyed in October 2011 to provide secondary and tertiary relocation areas, if needed. The control site for the proposed translocation project has yet to be determined.

The exact number of desert tortoises to be translocated to the proposed translocation site is unknown. Based on survey data collected in October 2010, 25 to 103 desert tortoises are estimated to occur on areas to be disturbed. The USFWS-approved Desert Tortoise Translocation Plan will include a description of all translocation-related sites and translocation procedures. The Biological Opinion will contain any additional measures for desert tortoise that are necessary to minimize adverse impacts to desert tortoise such as:

1. Oversee establishment and functionality of sediment control devices as outlined in the Storm Water Pollution Prevention Plan. Ensure that Best Management Practices (BMPs) are in place and working properly on a weekly basis.
2. Awareness training for desert tortoise will be provided to all construction crews and operations staff (performed by qualified personnel only).
3. Authorized desert tortoise biologists will monitor the construction activities daily during the initial site disturbance (including installation of permanent desert tortoise exclusion fencing) and at weekly intervals after all tortoises have been removed from the site. Exclusionary fencing will be checked monthly and after any substantial rain event to ensure that they are effective barriers for desert tortoise.
4. Implement controls at entry locations to facilitate weed management and invasive species control in order to minimize infestation to the project area from an outside source. Trucks and other large equipment will be randomly checked before entering the site for any invasive species debris or seed.
5. A desert tortoise translocation plan shall be developed, reviewed and accepted by the BIA and Tribe, and approved by the Service. This plan will include the following details at a minimum: translocation protocol; health assessment protocol for all tortoise and disease testing of individuals that will be translocated greater than 1,640 feet; recipient and control area habitat assessment and suitability; assessment of desert tortoise population and health in the recipient areas; and preparation of a disposition plan for displaced animals.
6. During pre-construction surveys health assessments will be conducted for all desert tortoises that will be translocated. Assessments will include blood work,

and each desert tortoise will be radio tagged to aid in relocation during preconstruction clearance surveys.

7. A permanent perimeter, exclusionary fence will be constructed around the solar facility boundary. Construction of the exclusionary fence will be monitored by an authorized desert tortoise biologist in order to eliminate impacts to tortoise burrows or live tortoises.
8. Pre-construction clearance surveys to remove tortoise from the construction area will be conducted following Service protocol (2009). These surveys will include surveying mowing areas, brush clearing areas, and ground-disturbance areas. Surveyors will search for desert tortoises and noxious weeds to prevent the spread of noxious plant species.
9. Roving biological monitors will be assigned to monitor the various construction crews in active construction areas until 100-percent tortoise clearance is confirmed. Biological monitoring also would be present and monitor access road improvements.
10. The Applicant will pay a fee based on acreage of disturbance to the Tribe for disturbance of Tribal lands and to the BLM for disturbance of BLM lands. The fees will be assessed at a rate of $786 per acre, if paid before March 1, 2012, into a Tribal conservation fund ($1,682,826) and to the BLM for 12 acres of disturbance ($9,432). After March 1, 2012, the rate increases to $810 per acre ($1,734,210 into the Tribal account and $9,720 into the BLM account). The Tribe and Service shall agree upon how the funds will be spent as outlined in the Biological Opinion.
11. The Service and Tribe will determine the final boundaries of the area(s) to be conserved where most displaced desert tortoises establish their home ranges, within 3 to 5 years following their release. The Service determined that no more than 6,000 acres should be conserved or preserved according to the Biological Opinion which may occur on the primary recipient site or other areas as agreed upon by the Tribe and Service.
12. An authorized desert tortoise biologist must be present during maintenance activities if occurring outside of the perimeter fence. Pre-maintenance clearance surveys followed by temporary exclusionary fencing also may be required if the maintenance action requires ground or vegetation disturbance. Authorized desert tortoise biologists will flag the boundaries of areas where activities would need to be restricted to protect tortoises and their habitat. Restricted areas will be monitored to ensure their protection during construction.
13. Speed limits within the project area will be restricted to less than 25 miles per hour (mph) during construction and operation. Speed limit signs will be posted along the access road.
14. Lighting will be focused in toward the solar facility and downward to avoid lighting habitats beyond the project perimeter.

15. Monitoring for the presence of ravens and other potential human subsidized predators of desert tortoises will be conducted and a control plan will be implemented if predator densities substantially increase in the vicinity of the facility. BMPs to discourage the presence of ravens onsite include trash management, elimination of available water sources, designing structures to discourage potential nest sites, use of hazing to discourage raven presence, and active monitoring of the site for presence of ravens.
16. A Weed Management Plan, which will be approved by the Service, BIA, BLM and the Tribe, will be implemented prior to the initiation of ground disturbing activities. Measures in the Weed Management Plan include: worker awareness training; limiting ground disturbance to designated areas only; maintenance of vehicle wash and inspection stations and close monitoring of materials brought onto the site to minimize the potential for weed introduction; reestablishment of native vegetation in disturbed areas to prevent weeds from colonizing newly disturbed areas; and, regularly scheduled monitoring to quickly detect new infestations of weeds, coupled with rapid implementation of control measures to prevent further infiltration.
17. All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers, equipment, vehicles, and construction materials shall remain within the ROW, existing roads, and designated areas. Staging areas will be located in previously-disturbed areas whenever possible.
18. Final tower and spur road locations will be adjusted to avoid potentially active tortoise burrows to the greatest extent feasible.
19. Crushing of perennial vegetation in work areas will be avoided to the maximum extent practicable.

The Applicant has incorporated the following measures to help avoid or reduce impacts on the desert tortoise:

- Desert Tortoise Translocation Plan,
- SWPPP,
- SPCC Plan,
- Waste Management Plan,
- Weed Management Plan,
- Restoration Plan and Facility Decommissioning Plan,
- Environmental Clearance, and
- Desert Tortoise Measures.
- Worker awareness and education program

Adverse impacts on desert tortoises would occur with the implementation of the Proposed

Project and activities associated with the O&M. These impacts would be both short- and long-term and would be localized, extensive, and area-wide within the Proposed Project. Impacts would be localized as a result of the removal of all desert tortoises from the solar facility and the loss of suitable desert tortoise habitat due to the construction of exclusionary fencing. Temporary impacts would be short-term and localized to the proposed transmission lines and water pipeline ROWs. These ROWs would not be permanently fenced; however, desert tortoises could be relocated from these corridors during construction and a temporary impact to vegetation and loss of burrows could result. Impacts would be extensive as well; in addition to the loss of 2,000 acres of suitable desert tortoise habitat in the Dry Lake Valley that would result from the Proposed Project, translocated individuals would likely impact the fitness of resident desert tortoises that already occupied the translocation site. As such, the Applicant will be required to adhere to all mitigation measures outlined in a project-specific Biological Opinion and to implement a USFWS-approved Translocation Plan as part of the Biological Opinion.

### Bats

The four protected bat species: California-leafed nose bat, California myotis, Townsend's big eared bat, and big free-tailed bat, are only expected to be present within the Proposed Project during nocturnal foraging events. Artificial lighting and the presence of the temporary storage water pond could alter the foraging behavior of bat species. The loss of the natural vegetation could decrease the prey availability (i.e., insects) within the Proposed Project for nocturnally feeding bats. Additional light sources during the operation could result in a concentrated foraging location as the artificial lighting could attract insects.

### Wild Burro

The wild burro would be susceptible to visual and noise disturbance during construction activities and O&M, potentially resulting in behavior alteration to avoid the site.

Given the sites proximity to and fragmentation by I-15, it is highly unlikely that wild burros would visit the Proposed Project. The Applicant has incorporated the following measures to avoid or minimize impacts on the wild burro should they inhabit the surrounding area:

- Restoration Plan and Facility Decommissioning Plan, and
- Environmental Clearance.

### Birds

Construction of the Proposed Project could cause adverse impacts on avian species, including nesting raptors and birds protected by the MBTA and BGEPA. Impacts on these bird species would typically result from activities that would cause nest abandonment or take of chicks or eggs in active nests, mortality of adults due to collision, or reduction of potential forage and nesting habitat. For most species, the Proposed Project impacts would be confined to areas immediately adjacent to and within the solar facility boundary. For other species such as raptors, project-related impacts would have the potential to extend up to ten miles or more beyond the Proposed Project depending on the foraging nature of the raptor species.

Active bird nests in shrubs or near the ground would be susceptible to being crushed during ground-disturbing activities. Noise and visual disturbance caused by construction and project-related traffic, including construction at work sites and traffic along Proposed Project access roads would have the potential to cause nest abandonment or habitat avoidance by birds nesting on or off site in adjacent areas. Nest abandonment would result in mortality to chicks and eggs. Alternately, construction may cause birds to avoid suitable habitat by opting to nest or forage in less suitable habitat. Such impacts would cause potential energetic costs to these birds and could indirectly contribute to stress and eventual mortality. Decreased foraging success could decrease the survivorship of chicks in nests near the Proposed Project.

The construction of new electric transmission lines could potentially increase the risk of mortality of adult raptors and larger non-raptor species by collision. The Applicant has incorporated the following measures to avoid or minimize impacts on bird species:

- SWPPP,
- SPCC Plan,
- Waste Management Plan,
- Weed Management Plan,
- Restoration Plan and Facility Decommissioning Plan,
- Bird and Bat Conservation Strategy, and
- Environmental Clearance.

Adverse impacts on MBTA protected species and raptors would occur with the implementation of the Proposed Project and the O&M. These impacts would be both short- and long-term and would be localized. To further avoid and reduce impacts, the following mitigation measures are recommended:

- Preconstruction survey,
- Best management practices,
- Biological monitors,
- Worker Environmental Awareness Program, and
- Scheduling site disturbing construction activities to avoid avian breeding and nesting seasons.

There is the potential for Golden Eagles to use the Proposed Project for foraging. These birds would be susceptible to visual and noise disturbance as described above, potentially resulting in alteration of foraging behaviors.

Golden Eagles are protected by the BGEPA, which includes the September 11, 2009 Eagle Rule (Rule) 50 CFR parts 13 and 22. The construction and O&M of the Proposed Project is not expected to result in take. The Proposed Project would impact suitable foraging habitat; however, the 2,000 acres of presumed foraging habitat that would be lost is miniscule (0.04% assuming 10-mile foraging area) in comparison to available habitat within Dry Lake Valley.

The Proposed Project does not contain any nesting habitat for Golden Eagles and a review of Golden Eagle occurrences compiled by NDOW does not identify any sightings of Golden Eagles; however, remnant nests within 10 miles of the Proposed Project boundary do exist in the Arrowhead Canyon Mountains. The closest suitable Golden Eagle nesting habitat is approximately 7-10 miles west of the Proposed Project. Due to the distance between the Proposed Project and suitable nesting habitat, the Proposed Project would not directly impact nesting Golden Eagles.

Golden Eagles would be susceptible to injury and/or mortality from collision with power lines or electrocution associated with the Proposed Project and its associated infrastructure. The Proposed Project would result in 5.0 miles of new, up to 500kV transmission line and approximately 3.0 miles of 12kV transmission line, which is a small percentage of the length of existing transmission lines in Dry Lake Valley and specifically within the BLM-managed utility corridor in which additional transmission for the Proposed Project would be built.

Mitigation measures specific to operations are detailed in the Bird and Bat Conservation Strategy (Appendix O) and outlined in Chapter 5 – Mitigation. The Applicant has incorporated the following measures to help avoid or reduce impacts to special status bird species.

- SWPPP,
- SPCC Plan,
- Bird and Bat Conservation Strategy,
- Waste Management Plan,
- Weed Management Plan,
- Restoration Plan and Facility Decommissioning Plan, and
- Environmental Clearance.

### Moapa Dace

The Moapa dace will not be directly affected by the physical construction and maintenance of the Proposed Project; however, groundwater pumping activities associated with the action are interrelated. The effects of the proposed groundwater pumping associated with the project on the Moapa dace were previously analyzed in the Programmatic Biological Opinion, which evaluated the effects of the cumulative groundwater withdrawal of 16,100 AFY from the carbonate aquifer in Coyote Spring Valley and California Wash on the endangered Moapa dace. On July 14, 2005, an MOA was signed by Southern Nevada Water Authority (SNWA), Meadow Valley Water District (MVWD), Coyote Springs Investment (CSI), Tribe, and the Service, regarding groundwater withdrawal of 16,100 afy from the regional carbonate aquifer in Coyote Spring Valley and California Wash Basins that included conservation measures for the Moapa dace. The MOA outlined specific conservation actions that each party would complete in order to minimize potential impacts to the Moapa dace should water levels decline in the Muddy River system as a result of the cumulative withdrawal of 16,100 afy of groundwater from two basins within the regional carbonate aquifer system. The Applicant is only one of multiple parties that will be withdrawing groundwater from the Coyote Spring Valley and California Wash basins under the programmatic action. The anticipated effects from this project are consistent with those anticipated in the Programmatic Biological Opinion. Per the conclusion in the USFWS Biological Opinion for the Proposed Project, the use of 72AFY of the 16,100 AFY for the Proposed Project will independently have no significant impact on the Muddy River Springs area discharge and subsequently the Moapa dace. However, use of water for the Proposed Project will become part of the environmental baseline for future groundwater withdrawals for the affected aquifer.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Alternative I would be constructed and operated similar to the Proposed Project, with the exception of completion of Phase 3 within the solar facility and a reduction in length of the proposed up to 500kV transmission line. Overall impacts to sensitive species would be decreased by over 500 acres. Translocation of desert tortoise from the Phase 3 location would not take place and therefore result in a decrease of direct impacts to this species. Fencing the Phase 1 and 2 areas upon the mesa could result in isolating the existing population of desert tortoise within the Phase 3 area. This isolation and decreased access to foraging grounds within the Alternative I Project Area could lead to increased pressure and mortality of the existing desert tortoises. Isolation could also produce a corridor effect in which desert tortoises would be forced to move within a linear corridor created by the existing railroad levee and the Alternative I Project Area. This change in normal home-range behavior may allow increased predation as desert tortoises are funneled into a corridor on and off the mesa. Overall impacts to acreage would be decreased; however, the resulting impacts to desert tortoise would remain the same or potentially increase for Alternative I.

Impacts to bats, wild burro, Golden Eagles and the Moapa dace from Alternative I would be similar to the Proposed Project.

### No Action Alternative

Under this alternative, there would be no construction; therefore, there would be no project-related effects on special status species.

#### 4.8.4.2. Residual Effects – Special Status Species

Construction and operation of the Proposed Project would result in residual effects to special status species similar to those described in the previous wildlife section. The construction of the perimeter fence would severely reduce the ability of most special status species to access the fenced portions of the Proposed Project. The loss of access would not be mitigated by any of the recommended mitigation measures and would continue to affect special status species throughout the lifetime of the Proposed Project. This loss of habitat would drive affected special status species to rely more heavily on habitat within the surrounding area, therefore increasing the pressure on these resources.

The proposed mowing regime for the management of vegetation following the tilling of all the vegetation within the perimeter fence would also have a residual effect on special status species. Continual mowing of any vegetation that would re-colonize the area within the perimeter fence could result in a change in the species composition of the vegetation community.

Translocation of desert tortoises would result in detectable residual effects. Even with the Applicant successfully implementing the recommended mitigation measures, the translocation process would still have the potential to adversely impact both the tortoises being translocated and those existing tortoises occupying the relocation area. The translocation could result in adverse impacts from increased competition for resources (i.e., food, shelter, water) within the relocation site, introduction of disease, and increased stress among the tortoises. Detailed information on proposed numbers and allowable take of desert tortoise can be found in the Biological Opinion (Appendix B).

## 4.8.5. Summary of Direct and Indirect Effects of the Proposed Project and Alternative I on Biological Resources

### Loss of Forage Acreage and Impact to Vegetation and Wildlife

Direct effects to the existing ground cover that serves as forage for wildlife would occur from grading and surface disturbance for Proposed Project infrastructure (i.e., the substation, access roads, maintenance roads, the perimeter road, service roads, the perimeter fence, fire breaks, parking areas, tower foundations for the transmission lines, underground collection lines, staging areas, the evaporation pond, the O&M building, and the solar modules). Placement of infrastructure would lead to the direct loss of forage, nesting, and habitat vegetation within the Proposed Project. Given the size of the Reservation (over 70,000 acres), loss of habitat on a maximum of approximately 2,000 acres that would occur due to implementation of the Proposed Project is not considered significant.

### Changes in hydrology and downstream resources

The Proposed Project would result in the slight alteration of physical topography and surface hydrology in the vicinity of the proposed solar facility. Natural flow from major precipitation events would be altered, though managed, causing moderate direct impact and minimal long-term indirect impacts to riparian areas within the Proposed Project. The Applicant would need to implement the SWPPP, the Restoration Plan, and Facility Decommissioning Plan in order to minimize long-term effects and to help avoid or reduce impacts to downstream structure and limit long term effects of downstream sedimentation.

### The introduction or spread of invasive or noxious weeds

Grading and surface disturbance activities during construction and decommissioning would disturb soil within the Proposed Project and create areas of bare ground. This disturbance would unearth dormant weed seeds and create opportunities for noxious and invasive weed species to colonize these areas. Increased vehicle traffic during all phases of the Proposed Project (construction, O&M, and decommissioning) also carries the potential to introduce weeds.

Vehicles are effective at disbursing weed seed to uninfected areas where plants may then become established. Noxious and invasive weeds directly and indirectly impact wildlife resources. Weeds can diminish the value of foraging sites by displacing quality forage plants. Weeds effectively compete with forage species for sunlight, soil, water, nutrients, and space, thereby reducing native forage productivity. In order to minimize long-term impacts, the Applicant would implement a Weed Management Plan.

### Effect on Sensitive Species

Desert tortoise and Golden Eagle foraging habitat will be directly impacted by the Proposed Project. A Translocation Plan will be implemented to manually remove all desert tortoises within the 2,000-acre solar facility to an area approximately 3 miles north, but still on the Reservation. Golden Eagles may lose up to 2,000 acres of potential foraging area and have increased potential for injury as a result of direct collision with new electric transmission lines. Sensitive species would be impacted by direct and indirect circumstances as detailed above.

**Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line**

Alternative I would be constructed and operated similar to the Proposed Project, with the exception of completion of Phase 3 of the solar facility and an overall decrease in impacts of approximately 500 acres. Alternative I would impact resources in a manner similar to the effects listed for the Proposed Project.

## 4.9. Cultural Resources

As outlined in Chapter 3, historic, cultural and religious properties and archaeological resources are documented in the area surrounding the Proposed Project. Archaeological artifact scatters and features that have been previously reported in the Proposed Project have been recommended not eligible for the NRHP and do not qualify as historic properties. In addition, there are no historic standing buildings or significant religious properties identified in the Proposed Project. Historic properties present in the Proposed Project are historic linear transportation corridors and some associated artifact scatters and features. These linear transportation corridors are: the San Pedro, Los Angeles, and Salt Lake City Railroad (26CK5685) now operated as the Union Pacific and Southern Pacific Railroad. Although not in the area encompassed by the Proposed Project, the Congressionally designated Old Spanish National Historic Trail lies east of I-15 in vicinity of the Proposed Project and crosses to the west side of I-15 approximately 3 miles north of the Proposed Project (See Figure 3-14).

### 4.9.1. Indicators

The Proposed Project would affect a historic property or a religious or traditional cultural resource if it would:

- Directly or indirectly displace or destroy important cultural artifacts, features, sites, buildings or structures that contribute to the eligibility of a historic property;
- Alter aspects of the character of cultural artifacts, features, sites, buildings, or structures that make a historic property significant;
- Alter important aspects of the historic setting or feeling of the period of significance of a historic property; or
- Alter the sacred or traditional character of a religious or traditional cultural resource, or impede access to or use of that site.

### 4.9.2. Direct and Indirect Effects by Alternatives

The Applicant conducted a Class I overview of the Proposed Project and adjacent areas for 1-mile in all directions and in December of 2010 and June 2011 conducted a Class III intensive pedestrian survey of all portions of the Area of Potential Effect (APE) of the Proposed Project that had not been previously surveyed to current standards. The cultural resources inventory documented only one cultural resource site within the APE and it has been evaluated as non-eligible for listing on the National Register of Historic Places.

Concurrence with this determination was received from the Nevada State Historic Preservation Office on November 8, 2011. BIA and BLM satisfied their obligations under Section 106 of the NHPA. The cultural resource documentation for the Proposed Project and Alternative I can be found in Appendix G.

### The Proposed Project

The entire APE of direct impacts has been systematically surveyed for cultural resources within the past 10 years. In addition, the historic setting of these historic transportation corridors may contribute to the significance of contributing structures and segments.

The APE of indirect impacts includes the viewsheds of contributing structures and segments associated with these linear historic properties. Impact assessment addresses whether the segments retain essential historic integrity and contribute to the significance of the larger linear property, what elements of the natural and physical environment contribute to the integrity of historic setting and feeling for contributing segments of these linear resources, and how the Proposed Project may alter those elements of the natural and physical environment.

The historic railroad (26CK5685) runs northeast outside the southeast side of the solar facility boundary. The existing access to the Crystal substation, which will also be used as access for the Proposed Project, parallels the railroad and I-15 from Nevada State Highway 93 to just south of the substation. There will be minor improvements or modifications to this portion of the access road. A portion of the railroad grade parallels the southeast boundary of the solar facility. There will be no physical disturbance to the railroad or any associated features and there will be no new Proposed Project structures or features in the immediate area of the railroad. Specific character and features of the natural and physical environment in this area do not contribute to the historic setting and feeling of the railroad. The fully modernized grade in the Proposed Project area does not contribute to the significance of the railroad. The presence of the Proposed Project will not affect the integrity of the historic setting or feeling of this property.

The Old Spanish National Historic Trail is visible at a point from the Proposed Project to a point 3 miles north, but only intermittently due to elevation and I-15. To the south of the Proposed Project, the solar facility and infrastructure is not visible until a point 2.5 miles south near KOP 5 (See Figure 3-14). Physical evidence of this portion of the trail is absent or overwhelmed by off road vehicle trails and existing Reservation roads. No wells, way stations or wagon road improvements are documented for this portion of the trail. This segment would have been a braided swath of pack trails and swales. No observed segments in the Proposed Project vicinity have been documented as retaining historic integrity. The Proposed Project will not alter this setting as seen in the Visual Assessment.

As discussed in Visual Resources, the solar modules and other Proposed Project features may be visible intermittently from I-15 and portions of the Old Spanish National Historic Trail from the north and south from 2-3 miles away. The solar modules would be low to the ground in the middle distance and would not be a dominant visual element on the landscape. The Proposed Project will have no adverse effect on any Historic Properties.

A prehistoric lithic scatter (26CK9415) was found within the proposed up to 500kV transmission line corridor. This site would be located between one of the major spans, between two towers and easily avoided during construction in order to sustain it for tribal interest on their Reservation. The site will be flagged and roped off during the transmission line construction period to maintain no effects to this sensitive area.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Alternative I would include Phase 1 and 2 of the Proposed Project. All cultural and historical impacts of Alternative I within the solar facility would be similar to the Proposed Project. The Alternative I proposed up to 500kV transmission line would be located towards the south end of the solar facility boundary and cross the desert in a direct line to the Crystal substation. This corridor was surveyed in December 2010. The southwest end of the transmission line corridor comes within approximately 800 feet of the recorded route of a segment of the historic Mormon Road and non designated Old Spanish Trail (26CK3848). There are many trail segments associated with this site number. This segment is not part of the designated alignment of the Old Spanish National Historic Trail. Dobschuetz and Wilcox (2006) reported that in the project vicinity the designated alignment of the Old Spanish National Historic Trail is several miles to the southeast on the far side of I-15. The portion of the trail segment associated with 26CK3848 near the current project was observed by Dobschuetz and Wilcox (2006) near their transmission line survey corridor about 0.5-miles north of the Crystal substation. This portion is outside the BLM utility corridor, but within about 1000 feet of an isolated, existing transmission line. The visual setting of this portion of the trail is dominated by the substation to the south and several large transmission lines. There are no identifiable traces of the trail in this location. This segment does not have readily identifiable physical remains or associated artifacts and the setting does not retain historic integrity. Dobscheutz and Wilcox (2006) evaluated this segment as "non-contributing" to the significance of the Trail and as "not eligible." SHPO concurred with this determination during the consultation process for the previous project that prompted Dobschuetz and Wilcox's survey. Current observations were consistent with this evaluation. Alternative I will have no adverse effect on any Historic Properties.

### No Action Alternative

Under the No Action Alternative, the Proposed Project would not be developed and there would be no direct or indirect effects on known historic properties or on cultural or religious resources. Other activities unrelated to the Proposed Project could impact cultural resources and there would be no conditions of the No Action Alternative that would avoid or mitigate these impacts.

### 4.9.3. Residual Effects

Direct effects to cultural resources are permanent and irreversible. Any direct effect to a historic property that cannot be avoided, including mitigation, would be a residual effect. This would also apply to indirect effects that occur later in time and alter the character of the historic property. Indirect effects to the historic setting or feeling of a historic property such as visual intrusion on the historic setting can sometimes be mitigated by removal or alteration of the intrusive element, visual shielding, or restoration of the historic setting. Should any unrecorded cultural resources be discovered during construction, all activities within the immediate area of discovery shall cease. The Chairman of the Moapa Tribal Council and the BIA Regional Archeologist shall be notified immediately and, consulting with BLM and SHPO as appropriate, they will make arrangements to assess the nature of discovered cultural resources and mitigate any damages to any unanticipated discoveries.

## 4.10. Socioeconomic Conditions

This section discusses effects on social and economic resources that may occur with implementation of the Proposed Project or alternatives. First, the indicators used to identify and analyze effects are presented, and then potential effects are discussed. This discussion format is organized separately for both social and economic conditions.

The additional jobs created by the Proposed Project would be a benefit to the Tribe and community. In addition to employment benefits, there would be numerous benefits to Reservation-area businesses. The Proposed Project would require a wide range of supplies and services, some of which could be provided by existing local enterprises. The Tribe currently has relationships with local businesses, which would continue if the Proposed Project is built and operated.

### 4.10.1. Indicators

National Environmental Policy Act provides no specific thresholds of significance for socioeconomic impact assessment. Significance varies based on the setting of the Proposed Project (40 CFR 1508.27[a]), but 40 CFR 1508.8 states that indirect effects may include those that are growth-inducing and others related to induced changes in the pattern of land use, population density, or growth rates. In addition, the regulations state, “Effects include….cultural, economic, social, or health, whether direct, indirect, or cumulative.” Effects may also include those resulting from actions that may yield both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial (40 CFR 1508.8).

For the purposes of this report, the Proposed Project would affect social and economic conditions if it would:

- Result in a permanent or temporary population increase larger than local services, infrastructure, or population can accommodate; or result in a tax burden to local residents not offset by the Proposed Project's generation of revenues.

## 4.10.2. Direct and Indirect Effects by Alternatives

This section describes effects under each alternative following the requirements described under NEPA. During the construction phase, the increased spending on wages, materials, and services should have beneficial direct and indirect effects on local businesses. No indirect impacts are anticipated during the operational phase because spending and employment would remain approximately the same as at present. During the operational phase of the Proposed Project the facility workforce, payroll, expenditures on materials and services, and taxes would remain at approximately the same level as at present. Therefore, the Proposed Project should not result in any long-term change in the population size, number of housing units, employment level, income, transportation, or demand for services in the Moapa area.

### The Proposed Project and Alternative I

The socioeconomic impacts associated with the Proposed Project and Alternative I are discussed in detail below under each resource section. Due to the similarities of the two proposed projects and the resulting socioeconomic issues, the beneficial or detrimental impacts were assumed to be equal.

### 4.10.2.1. Social

This section discusses potential effects to the social well-being of groups representing the concerns of area stakeholders. Effects to the social welfare of these groups may potentially occur during implementation of the Proposed Project or Alternative I. Potential social effects described in terms of effects to social well-being relate to how a particular social group, individual, or stakeholder interprets how the Proposed Project or Alternative I may affect their environment and how such an effect relates to the integrity, quality, use, and enjoyment of socioeconomic resources.

Resources are broadly defined and can include, for example, historically used open spaces and quality habitat supporting recreation and wildlife appreciation and other resources necessary to maintain the historic quality of life that influences the social well-being of stakeholders. Social well-being can potentially be affected by each phase of the proposed project (construction, O&M, and decommissioning). Social well-being can also be influenced by the level of participation and perceived degree of control that stakeholders have over their environment, its resources, and the government institutions that have stewardship obligations to manage these resources in a sustainable manner.

### 4.10.2.2. Demographics and Social Trends

#### Population

Construction. The construction phase is expected to have a short-term, negligible impact on the Clark County population level. The impact would not cause a temporary population increase that would necessitate additional local public services or investment in infrastructure capacities that could not be provided from existing resources.

During the peak construction, the workforce could reach 400; however, the Applicant expects the majority of workers to be local. The temporary population influx could be accommodated by Clark County where infrastructure is designed for peak seasonal demands and fluctuations from global tourism.

Operations and Maintenance. The operational phase is expected to have a long-term, beneficial impact on the area's population level. When all phases are completed and the Proposed Project or Alternative I is commissioned, up to 35 permanent staff would be required to operate and maintain the facility and provide plant security.

Total unemployment in Clark County as of June 2010 was 141,456 persons. Permanent employment of 35 jobs would be 0.02 percent of the most recent level of unemployment (USCB 2010).

#### Housing

Construction. The construction phase is expected to have a short-term beneficial impact on the Clark County permanent and temporary housing stock. The impact would not cause a temporary strain that would necessitate additional local public services or investment in public infrastructure capacities that could not be provided from existing resources. Clark County has a high vacancy rate for rental units, and a large hotel/motel room inventory characterized by declining occupancy rates given the slow pace of the economic recovery. Therefore, sufficient temporary housing should be available within the Greater Las Vegas/Clark County area to accommodate non-local workers and their families/dependents during the length of construction. The small incremental demand from these workers would be beneficial to the housing and lodging sectors that have been negatively impacted by the recession.

Operations and Maintenance. The operational phase is anticipated to have a long-term beneficial effect on the area's housing stock. The Proposed Project would permanently employ approximately 35 full-time workers, which the Applicant anticipates would be local workers from the region and permanent residents. Therefore, the housing impact would be negligible; however, any incremental long-term stimulus to the housing sector from net migration would be beneficial to the economy. Some permanent workers could relocate to the Clark County area and would be expected to either purchase or lease homes during their long-term work tenures.

### 4.10.2.3. Economic Base Impacts: Employment, Earnings & Income

The construction phase's mobilization of resources (i.e., manpower, materials, supplies, and equipment) would be beneficial to the regional economy. Construction spending would provide a non-recurring demand stimulus that would increase other inter-dependent sectors, industries, and households within Clark County over the construction period. During operations, permanent direct employment, payroll, and O&M-related spending would provide a long-term positive recurring stimulus to the local Tribe and region's economy.

Total economic impacts include both direct and indirect effects associated with the linked supply chain and spending from household wages. Direct effects represent the impacts of direct expenditures from construction activity such as payroll spending and locally-procured supplies and equipment to support the installation. As initial spending is received and subsequently re-spent by suppliers and vendors, indirect impacts would be created from these successive rounds of spending. Induced effects capture the impacts from wages spent by workers/households that are directly and indirectly impacted.

Impacts as a result to the preservation of 6,000 acres for desert tortoise relocation could have adverse impacts upon the Tribe due to loss of use of land for the life of the Proposed Project. The area chosen for relocation is located in a remote part of the Reservation with limited infrastructure for access or water. Development of this area would be limited to renewable resources or fossil fuel industrial facilities. Loss of this land could have long term significant impacts to the economic base for the Tribe; however is only 8 percent of the land base within the Reservation.

#### Employment

Construction. The construction phase is expected to have a short-term, beneficial impact on Clark County's and the Reservation's employment levels. Social and Economic Conditions (Section 3.6) documented that the Clark County construction sector has been impacted by the recession. The projects would provide a short-term boost to this sector since the majority of construction workers would be hired from the local region. The construction phase is expected to last four to five years, spanning a period from 2012 to 2016: Phase 1 from 5/2012 – 6/2013; Phase 2 from 7/2013 – 12/2014; and Phase 3 from 1/2015 – 6/2016.

During peak construction activity, employment would reach approximately 400 workers. Across the entire construction phase, the average workforce is expected to number approximately 250-300 workers. These figures are estimates and may fluctuate based on weather conditions and schedule.

It is likely that the local workforce would commute from the Clark County/Greater Las Vegas region and most of their earnings would be recycled back into the Clark County regional economy through spending of disposable income. In addition, non-local workers would provide a temporary stimulus to the local economy as they spend per diem money on hotels, meals, and consumables. However, unlike local workers who permanently reside in Clark County, non-local workers would be expected to spend most of their earnings outside of the region. Some direct spending generated from local workers would also be expected to leave the region as the total regional demand for goods and services could not be entirely satisfied from local production.

The types of jobs (i.e., the composition of the labor force) are expected to be relatively high paying and would be related to completing tasks such as environmental clearance and permitting, site access/laydown, site preparation, and O&M building construction. Workers with skills necessary for drainage controls, substation/switchyard erection, overhead pole and line construction, and PV equipment installation and commissioning would be mobilized. These jobs have been targeted as clean energy/renewable energy opportunities that are expected to grow at above-average rates and pay above-average wages. The Proposed Project would, therefore, help diversify the labor force of the Clark County and add capacity and valuable utility-scale solar installation experience to the local labor pool.

The direct spending from payroll and direct expenditures on locally-procured materials, equipment, and supplies would also create jobs. The jobs created are important in helping the Clark County region resume a normal, steady-state growth path and economic recovery. This is particularly the case as the economy is currently operating below capacity with large numbers of construction workers either unemployed or working in part-time, underemployed positions that do not fully utilize their skills and experience.

Operations and Maintenance. During the operational phase, the Proposed Project is expected to employ approximately 35 full-time workers to operate and maintain the facility and to provide plant security.

### Unemployment

The construction and Operational phase is expected to have a short- and long-term, beneficial impact on Clark County's and the Reservation's unemployment levels. Under the current Tribal Employment Rights Ordinance (TERO) agreement between the Tribe and the Applicant, Tribal members would have first right of refusal for any job positions for which they are qualified. As a result of this agreement, unemployment levels within the Reservation could decrease in the short and long term.

### Earnings

The Proposed Project and Alternative I are expected to have a positive, short-term effect on employee earnings and personal income in Clark County and the Moapa area from the spending associated with employee payroll and direct spending on materials, equipment, and supplies. Table 4-10 shows the approximate yearly incomes of the O&M staff.

**Table 4-10.**
**Operations Worker Matrix**

| Worker Title | Quantity | Salary (1) | Extended Salaries* | Comments |
|---|---|---|---|---|
| General Manager | 1 | $ 120,000 | $ 120,000 | Overall Manager of Operations (P&L accountability) |
| Plant/Performance Engineer, EHS | 1 | $ 75,000 | $ 75,000 | Plant Engineer with EHS Responsibilities |
| Power/controls Engineer | 1 | $ 90,000 | $ 90,000 | Responsible for switchyard, inverters, 34.5 kV ac collection |
| Maintenance Supervisor | 1 | $ 75,000 | $ 75,000 | Manager of all Maintenance personnel |
| Water Truck Operators | 2 | $ 30,000 | $ 60,000 | Daily dust control & grounds maintenance |
| Module Cleaning Operators | 12 | $ 30,000 | $ 360,000 | Clean all PV modules |
| PV Maintenance Technicians | 8 | $ 45,000 | $ 360,000 | Preventive maintenance & repairs of PV arrays |
| Machinist | 1 | $ 60,000 | $ 60,000 | Responsible for providing machining support |
| Instrument & Controls Lead | 1 | $ 65,000 | $ 65,000 | Very skilled Supervisor, computer skills |
| Instrument & Controls Technicians | 2 | $ 50,000 | $ 100,000 | Controls systems and collection systems wiring |
| General Administration | 2 | $ 30,000 | $ 60,000 | Maintains building, water treatment & hydrogen plants |
| Security/Misc. | 3 | $30,000 | $ 90,000 | Maintains building and grounds (possibly outsourced) |
|  | 35 |  | $ 1,515,000 |  |

* Salary x Quantity

### Tourism and Traffic

Given the remote, sparsely-populated area where construction would take place, it is unlikely that tourism would be negatively impacted by construction activity in any material or noticeable manner. There is a sufficiently large stock of available housing and motel/hotel room inventory (an oversupply) in the region that can accommodate both tourists and additional non-local workers who require temporary lodging. Motel/hotel capacity and room utilization have been below capacity during the recession and temporary worker room demand would be positive for occupancy levels and the economy. This temporary demand would not be large enough to displace or interfere with regular tourist demand associated with gaming, entertainment, and typical, Las Vegas-visitor patronage. Construction workers, truckers, and others would likely increase visitorship to the Tribe's Travel Plaza, resulting in a beneficial increase in retail sales and gaming. A reduced but beneficial increase in expenditures would result from purchases and gaming by permanent O&M staff.

Traffic congestion would be unlikely during the construction phase or after plant installation. Thus, negative effects to tourism would be unlikely.

### Income

Construction. Construction is expected to have a positive, short-term impact on Tribal and regional income and the economy of Clark County. The total value of goods and services (including emission-free electricity output from operations) generated would be particularly beneficial to the economy, especially as resources are not fully utilized given the slow pace of economic recovery.

Operations and Maintenance. The O&M phase is expected to have a long-term, beneficial impact to the Tribal and regional economy and area personal income. Annual O&M spending would have a small, positive, annually-recurring impact on the Moapa area and Clark County regional economy.

The annual spending would last for the up to 50-year life of the assets and would also generate an additional, multiplicative, impact-demand stimulus to Clark County as permanent workers would spend disposable incomes and vendors would spend earnings and replenish inventories.

### Public Revenues

Construction. During construction, the Proposed Project or Alternative I would generate a short-term, positive, non-recurring contribution to Tribe and non-tribal public revenues through sales at the Tribal Plaza restaurant and store as well as local gas-stations, mini-marts and restaurants specifically located on I-15 at exit 63 south of the Proposed Project and exit 90 north of the Proposed Project. Additional revenues would be generated through the TERO program and potentially through sale of water during the construction phase.

During the construction phase, the local workforce would earn payroll and pay taxes on employee compensation that would flow to federal, state, and local jurisdictional treasuries. In addition, since tax revenues would also be generated from the indirect and induced economic activity stimulated by the initial and direct construction expenditures, tax revenues would be generated from household expenditures and indirect business taxation. In addition, sales taxes would be generated from direct spending on materials, equipment, and supplies. However, it is assumed that sales tax exemptions associated with spending on renewable energy infrastructure would apply.

Operations and Maintenance. Over the 50-year lease agreement of the Proposed Project or Alternative I, the Proposed Project would generate an annual fee to the Tribe as specified in the lease agreement. This long term predictable revenue would be used by the Tribe to expand social programs, economic development, resource protection or other purposes for the Tribe. Payments will also be made to the Tribe by the Applicant in lieu of taxes in accordance with the Tribal Tax Agreement.

In addition, the annually recurring of Reservation O&M expenditures would generate tax revenues to Clark County Nevada during the up to 50-year operating life of the solar facility.

### Decommissioning

The potential effects on socioeconomic resources from decommissioning options are expected to be beneficial and alternatively either of short or long duration, based on the particular option chosen. It is possible that the solar facililty may be upgraded with a new technology (to continue to utilize the area's strong solar radiation potential) at the end of its estimated 35-year lease life. If this option is chosen, the plant would continue to provide zero-emission electricity to the regional grid and make lasting contributions to meeting the region's projected load growth. In addition there would be short-term, construction-related benefits to incomes, employment, and output (from the upgrade project option). Over the long term, the land lease with the Tribe would most likely be renewed and the new, upgraded plant would employ both permanent workers and sporadic O&M worker teams.

It is also possible that the solar plant could be dismantled and the land made suitable for reclamation. Dismantling and reclamation/restoration activities would also provide a short-term stimulus to the local economy as special teams would be needed to safely disassemble plant assets and restore the site to its original condition. In addition, the underlying land would be freed up for other potential uses, including the historic, traditional desert uses of the property under tribal stewardship.

## 4.10.2.4. Community Infrastructure

### Public Services and Utilities

The incremental demand on public services during construction, operations, and decommissioning is not anticipated to result in extraordinary stresses placed on service capacities or infrastructure that could not be met by existing and projected public resources (i.e., projected county operating treasuries and capital expenditures already planned to meet population growth). As explained below in more detail, adequate resources exist within Clark County and the Moapa area that can accommodate the installation demands during construction.

Furthermore, operations would not result in a noticeable population increase in Clark County. In addition, over the long-term life of the solar facility, the assets would generate annual lease fees that would be sufficient to offset any new demands on tribal resources arising during operations.

### Water and Wastewater

Construction. During the construction phase, water would be used for dust control. During construction, a 150,000 gallon storage tank would be built for temporary storage of water. The storage tank would allow for water use during peak water-usage periods without adversely impacting other uses.

Wastewater generated during construction would include sanitary waste, stormwater runoff, equipment washdown water, and water from excavation (i.e., dewatering) during construction (if dewatering is required). The wastewater load during construction would be discharged to the septic system, the evaporation pond or could potentially be classified as hazardous or nonhazardous, depending on its chemical constituents, and would be processed and disposed of in accordance with the applicable laws governing these effluents.

Operations and Maintenance. During operations, water would be needed for panel washing and domestic use by approximately 35 on-site personnel. It is estimated that these requirements would amount to 19.09 AFY (6,220,500 gallons). Panel washing is scheduled to occur up to four times each year. The plant does not require process water for cooling purposes, and it is noted that PV water consumption during operations is between 95 percent and 99 percent less than that of concentrating solar power (CSP) projects. The Applicant has retained water rights up to 50 AFY for operational purposes. Water would be supplied by a nearby Reservation well. A permanent, 150,000-gallon aboveground water tank would be located in the O&M area to provide storage for operational water needs and water for fire protection.

The wastewater generated from panel washing would be non-hazardous and would drip to the ground and either evaporate or infiltrate into the ground. The O&M building would also generate on-site domestic water and sanitary sewer waste that would be treated and disposed of through an approved septic tank and drain field system. Given the small number of permanent staff operating the facility, these wastewater loads would be small.

### Fire and Emergency Medical Services

Construction. During a large-scale construction project, there is the potential for emergencies and accidents. In addition to design features for minimizing risk, Clark County also has resources near the Proposed Project and the Tribe has an agreement with Clark County Fire Department to provide fire protection and emergency medical response to the Reservation. The Fire Department currently has five fire stations that are manned by volunteer firefighters providing service to the area, including Station 72 in Moapa Town. These crews also respond to emergencies in sections of I-15. Because of the rural character of the area and volunteer staffs, response times are greater than in urban areas.

The Proposed Project and Alternative I would be built with features that could be used to quickly douse fires and reduce the potential for the spread of fire. A 20-foot wide fire break would be constructed around the exterior of the perimeter fence. A permanent, aboveground water tank would be located in the O&M area to provide storage for operational water needs and water for fire protection. In addition, the electrical equipment enclosures that house the inverters and transformers would be built with either metal or concrete structures.

Operations and Maintenance. During the operational phase, the on-site fire protection water system would be supplied from the above-mentioned water storage tank located near the O&M building.

In addition, resources from the local stations could also be mobilized in the event of an emergency.

### Police

Construction. The Proposed Project's built-in security features would function to place minimal demands on County or tribal police resources. Security at the solar facility would be achieved by a combination of fencing, lighting, and security patrols. The Applicant would provide 24-hour security during solar facility construction.

Operations and Maintenance. During operations, the solar facility would be staffed 24 hours per day, seven days per week. The staff would include full-time security, and regular security patrols would be conducted throughout the site. Lighting would also be provided at the O&M building and the main plant access road entrance. In addition, a perimeter security system may also be installed if deemed necessary.

### Hospitals

Construction. It is possible that accidents requiring ambulance services and hospital treatment may occur during the construction phase. To minimize this possibility, the Applicant would require all construction contractors to operate under an approved health and safety program that meets industry standards. In addition, all contractors would be required to maintain and carry health and safety materials including the Material Safety Data Sheets (MSDS) showing the physical and chemical properties and health hazard information of hazardous materials used on-site.

Operations and Maintenance. It should be noted that the UMC North Vista Hospital is located at 1409 E. Lake Mead Blvd., North Las Vegas, NV 89030. There is also a small medical facility located at the Reservation. It is possible that accidents may occur during Proposed Project operations. Given the small number of permanent staff manning the facility and the safety plan and protocols to be followed, the probability of occurrence of any accidents and their annual frequency is low. Therefore, the regional hospitals and emergency medical service facilities are expected to be able to fully accommodate any accidents requiring medical treatment and ambulance services with their current levels of staffing and resource deployment.

### Public Schools

Construction. The construction phase is expected to last five years. During that time, it is possible that some of non-local workers may relocate to the area with school-aged children. It is anticipated the some workers may, in fact, commute from a greater distance radius within the Las Vegas Metro area and their children may possibly be enrolled as students in city schools. Clark County School District provides public education services to the County. Northeast Clark County is served by two high schools, two middle schools, and three elementary schools. Ute Perkins Elementary School is located in Moapa Town. All have class sizes and student teacher ratios that are below the school district averages for the South region. These ratios suggest that additional students could enroll in regional schools without noticeably increasing the educational demands placed on the system, or changing the quality of the educational experience for existing pupils.

Together with other schools within the Clark County School District, it is likely that any additional students could be accommodated without placing any incremental resource demands on the public school system.

Operations and Maintenance. The operation of the solar facility would not be expected to have any noticeable effect on public school services as the estimated addition of 35 permanent workers is relatively small.

### Solid Waste

Construction. The construction phase is expected to generate solid wastes that can be easily accommodated by existing regional public facilities including waste management processing and recycling centers. During construction, the main type of waste created would be nonhazardous solid waste. However, some nonhazardous liquid waste and hazardous waste (solid and liquid) would also be generated. All of the hazardous wastes would be generated at the construction site. The types of waste and their estimated quantities would likely consist of paper, wood, glass, and plastics (five, 40-yard containers of solid construction waste per week during construction), and metal (one, 40-yard container of solid construction waste per week during construction).

As a priority, and where feasible, wastes would be recycled and non-recyclables would be disposed of on a weekly basis at a permitted landfill. The waste would likely go to the APEX Regional Waste Management Center located at 13550 N. US Highway 93. The Applicant would prepare a Waste Management Plan describing the storage, transportation, and handling of wastes, emphasizing the recycling of construction wastes where possible, and identifying the specific landfills that would receive construction wastes that cannot be recycled. Construction wastes would be managed in accordance with RCRA 42 United States Code (U.S.C.) 6901, et seq., RCRA's implementing regulations at 40 CFR 260, et seq., and other applicable state and local regulations.

Operations and Maintenance. During operations, the facility would likely generate solid wastes consisting of rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, discards and office waste, and other miscellaneous solid wastes. The quantity of all solid, nonhazardous waste generated is estimated to be approximately 40 cubic yards per year. This level of solid waste generation could be handled easily by the existing capacities of local waste management facilities, transfer stations, and area landfills. The design capacity of the APEX Regional Landfill is approximately 784 million cubic yards and a service life of 85 years. The APEX Regional Landfill accepts municipal solid waste, treated sewage sludge, and treated medical waste (CCCP 2010).

### No Action Alternative

Under the No Action Alternative, the impacts (detrimental or beneficial) described above for the Proposed Project or Alternative I would not occur. Under the No Action Alternative, the solar facility would not be constructed and there would be no additional employment. Under the No Action Alternative, the land that would have been occupied by the Proposed Project would continue to be used in the manner designated by the Tribe and BLM. Without the Proposed Project, the land may continue to remain undeveloped in the future. Under the No Action Alternative, it is likely that the land would continue to serve as a rural, undeveloped desert area providing habitat for species and land resources for traditional socioeconomic uses associated with this desert location (e.g., Tribal land.). Under the No Action Alternative, the utility off-taker (the utility or bulk-power purchaser and/or distributor) would not have access to the green energy supply that would have been produced from within Dry Lake Valley. Alternative renewable energy generation projects developed elsewhere may not meet stakeholder preferences for reliability, cost, and the environmental sustainability of this resource. Likewise, under the No Action

Alternative, final, end-use retail consumers would not experience any positive sense of social well-being as this alternative would not involve construction and operation of the solar plant and delivery of emission-free power. Under the No Action Alternative, there would be no adverse impacts to socioeconomic resources requiring mitigation that would be associated with the Proposed Project's construction, O&M, and decommissioning activities of the proposed 350MW plant. Under the No Action Alternative the Tribe would not have the transmission line infrastructure to the Tribal Plaza and would not benefit economically.

### 4.10.3. Residual Effects

During construction phases of the Proposed Project, there would be short-term and beneficial residual effects on population and housing, the regional economy, personal income and employment levels, public services, and tax revenues. During O&M phases, there would be long-term and beneficial residual effects on population and housing, the regional economy, personal income and employment levels, public services, and tax revenues. Effects on social and economic conditions from decommissioning are also expected to be beneficial.

### 4.10.4. Environmental Justice Impacts

This section discusses effects on environmental justice that may occur with implementation of the Proposed Project or alternatives. Data used for the environmental justice analysis were obtained from the 2000 Census and are presented in detail in the Environmental Justice Section.

As discussed in Section 3, Minority Populations and Low-Income Populations, the Proposed Project site is considered an environmental justice community with respect to minority populations. Residents on the Reservation represent the closest environmental justice population to the Proposed Project. As Native Americans, residents on the Reservation meet the criteria of a minority population and, thus, are subject to environmental justice consideration under the Executive Order. As such, any project-related impacts that would occur within the boundaries of the Proposed Project would have an effect on minority, Native American populations; however, it was determined that the effects of the Proposed Project would be positive on this population.

#### 4.10.4.1. Indicators

Consistent with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), this environmental justice analysis identifies and addresses any disproportionately high and adverse human health or environmental effects of actions on minority and low-income populations. The CEQ (1997) has issued guidance to federal agencies on the definition of disproportionately high and adverse effects as used in EO 12898, as follows:

### Disproportionately High and Adverse Human Health Effects

When determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

- Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms;
- Whether the risk or rate of hazard exposure to a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and
- Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposure to environmental hazards.

### Disproportionately High and Adverse Environmental Effects

When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

- Whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment;
- Whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceed or are likely to appreciably exceed those on the general population or other appropriate comparison group; and
- Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards.

## 4.10.4.2. Direct and Indirect Effects by Alternative

This section discusses potential direct and indirect effects on environmental justice populations under each alternative. Analysis for this section was completed by assessing potential temporary (i.e., construction) and permanent impacts due to the implementation of each alternative and comparing these impacts to the census tracts, block groups, and blocks within and in the vicinity of the Proposed Project.

### The Proposed Project

The footprint of the Proposed Project including the proposed transmission line that would connect to the Crystal substation is fully contained within the Reservation with the exception of the 0.5-mile ROW where the up to 500kV transmission line enters BLM land. The Moapa Reservation (CT 59.02) contains a Native American population that is considered a minority. The Proposed Project does not disproportionately affect minority and/or low-income populations. No displacements or permanent changes in populations would be necessitated. As discussed above, it is anticipated that the Proposed Project will have a positive effect on Tribal members and the non-Indian local population, by creating both temporary and long-term jobs.

#### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Because Alternative I's reduced footprint is located within the same census tract, block group, and blocks as the Proposed Project, the environmental justice impacts of Alternative I would be identical to those described under the Proposed Project. Alternative I does not disproportionately affect minority and/or low-income populations. It is anticipated that Alternative I will have a positive effect on Tribal members and the non-Indian local population, by creating both temporary and long-term jobs.

#### No Action Alternative

In the No Action Alternative, the Proposed Project would not be built. Under the No Action Alternative, the purpose and need for the Proposed Project would be provided by other means or not be met. The land that would have been occupied by the Proposed Project would continue to be used in the manner designated by the Tribe. It is possible that the land would continue to serve as a rural, undeveloped desert area providing habitat for species and land resources for the traditional uses (e.g., hiking, horseback riding, natural resource appreciation) associated with this desert location. Under the No Action Alternative, there would be no temporary or permanent impacts and/or benefits (such as jobs or lease payment) to any potential minority, low-income, or Native American communities either within or in the vicinity of the study area.

### 4.10.4.3. Residual Effects

The Proposed Project would have an effect on minority, Native American populations; however, it was determined that the effects of the Proposed Project would be positive on this population by creating both temporary and long-term jobs. The Proposed Project would not have any residual effects under this criterion.

## 4.10.5. Indian Trust Assets

The Proposed Project would impact the Reservation lands where the solar facility and associated ROWs are constructed. As described in previous sections, there is likely to be adverse impacts to soils from grading or clearing activities as well as construction vehicles on roadways. Impacts to vegetation and wildlife on or near the Proposed Project will also be adversely impacted. Indian Trust Assets, such as fishing rights, water rights, and minerals would not be impacted by the Proposed Project implementation.

## 4.11. Resource Use Patterns

This section discusses effects on lands and realty that may occur with implementation of the Proposed Project or alternatives.

### 4.11.1. Indicators

The Proposed Project would affect land use and realty if it would:

- Conflict with existing tribal, federal, state, or local land-use plans or policies;
- Conflict with existing BLM land-use authorizations; or
- Change public land disposition.

### 4.11.2. Direct and Indirect Effects by Alternatives

**The Proposed Project and Alternative I**

The Proposed Project and Alternative I would both be constructed almost entirely on Reservation land with the exception of the 0.5-mile ROW on BLM land. In both alternatives, the up to 500kV transmission line would connect the solar facility to the Crystal substation either via the BLM utility corridor or via a cross-country route south of the BLM utility corridor. Below is a discussion of potential impacts to lands and realty as a result of the Proposed Project or Alternative I.

### 4.11.3. Utilities

There would be no impacts to adjacent utilities as a result of the Proposed Project or Alternative I. The Applicant has designed the solar facility's associated utilities and infrastructure around existing and future transmission line and oil/gas pipeline ROWs. The alternatives would allow continued access to existing transmission lines and pipelines by their owners. There is currently an approximately 4,000-foot wide utility corridor managed by the BLM for which the Applicant is submitting a ROW application to the BLM. The proposed up to 500kV transmission line would parallel the outermost Kern River natural gas line on the southeast side at a distance required by safety and regulatory agencies. The Alternative I proposed transmission line would traverse the desert equidistant between the existing BLM corridor and Union Pacific Railroad levee, having a reduced effect on existing utilities. In either alternative, the transmission line would cross under existing electric transmission lines and enter the Crystal substation.

The 12kV line from the proposed solar facility would be constructed parallel to the existing water pipeline and be contained wholly within Reservation land with the exception of crossing I-15 and the existing Union Pacific Railroad. The Applicant would obtain any encroachment or road crossing permits required from Nevada Department of Transportation and the railroad. The 12kV line would either be placed under the existing railroad and interstate or span the transportation network with adequate vertical clearance as required by both entities and permit regulations.

The utility corridor is a "planned use" for utilities managed by the BLM. The Proposed Project site is located in an area predefined by the Tribe for economic development. The Proposed Project is adjacent to BLM lands slated for renewable (solar) development. No impacts to any federal, state, or local land-use plans or policies, existing BLM land use authorizations, public land disposition, or land tenure adjustments would occur as a result of the Proposed Project or Alterative I.

### 4.11.4. Airports

Perkins Field Airport in Overton, Nevada is the closest airport at approximately 16 miles northeast of the Proposed Project and Alternative I. The airport was constructed to support emergency landings from aircraft leaving Nellis Air Force Base and today is used mostly for local traffic. The airport averages about 100 flights per week. The next-nearest airport is Echo Bay Airport at over 20 miles away. The Proposed Project and Alternative I construction and operations will have no impact to airports or airport operations.

### 4.11.5. Hunting, Fishing and Gathering

No hunting, fishing or gathering has been reported or documented by the tribe in the vicinity of the Proposed Project. There will be no impacts to this resource as result of the Proposed Project or Alternative I.

### 4.11.6. Grazing Allotments

There are no grazing allotments within the Reservation at or near the Proposed Project or Alternative I. There are no foreseeable grazing applications within this part of the Reservation. The Proposed Project's up to 500 kV ROW and Alternative I ROW would cross through the Dry Lake (Allotment Number 15416) and Roach Lake (Allotment Number 02007) grazing allotments managed by the BLM. The 0.5-mile, approximately 150-foot wide, corridor that would connect the solar facility to the existing Crystal substation would not have significant impact to the grazing allotments as this area is highly developed with multiple utility lines and access roads. The current state of the allotments is unknown; however, is neither suspected to have grazing rights nor will grazing take place in the future at this location given the industrial nature of the area immediately surrounding Crystal substation.

### 4.11.7. Mining

There are no active mines or surface quarries within 5 miles of the Proposed Project or Alternative I. With the exception of a 0.5-mile transmission line ROW on BLM land, the

Proposed Project takes place on Reservation land. The Tribe has no future plans for mining within the Proposed Project or Alternative I area. The Reservation is not open to the public and thereby does not serve as a thoroughfare to potential mining areas around the Reservation. The Proposed Project and Alternative I would not inhibit access to leasable, locatable, and salable energy and mineral resources. The Proposed Project and Alternative I would have no impact on mining of public resources or limit the potential for mining on public lands.

#### No Action Alternative

Under this alternative there would be no construction; therefore, there would be no effect on land use and realty.

#### 4.11.7.1. Residual Effects

The Proposed Project would not have any residual impacts to land use relative to the criteria outlined in Sections 4.12.3 to 4.12.7.

### 4.11.8. Transportation/Motorized Vehicle Impacts

This section discusses effects on transportation that may occur with implementation of the Proposed Project or alternatives.

#### 4.11.8.1. Indicators

The Proposed Project would affect transportation levels if it would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;
- Produce an exceedance, either individually or cumulatively, of a level of service (LOS) standard established by the local county congestion management agency;
- Degrade existing road conditions as a result of construction;

#### 4.11.8.2. Direct and Indirect Effects by Alternative

This section describes effects under each alternative following the requirements described under the NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource area.

Effects may arise from physical changes to roads, such as closures and re-routing, construction activity, introduction of construction- or O&M-related traffic on local roads, or changes in daily or peak-hour traffic volumes created by workforce changes in the area.

### The Proposed Project

The Proposed Project would result in short- and long-term effects to traffic volumes, short-term, adverse effects to the LOS, long-term effects to access, and long-term, beneficial effects to road conditions.

*1. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.*

Construction of the Proposed Project would require activities and equipment movement near and within public roadway ROWs, resulting in short-term increases in the use of I-15 and local arterial roadways. Heavy equipment would be transported to the site and would likely remain for the duration of construction.

Construction of the Proposed Project would result in a short-term increase in traffic volume of a maximum of 800 trips per day (using a maximum number of workers on-site during the height of construction activities for 400 morning trips and 400 evening trips) due to the construction labor force (assuming they all drive separately). Additionally, construction would result in short-term increases in traffic volume of a maximum of 76 trips per day (38 trips to the site and 38 trips leaving the site) due to delivery of construction equipment and supplies to the site. These, combined, would result in an increase of 876 vehicle trips per day during construction over existing trips.

The Applicant is proposing to access the Proposed Project using North Las Vegas Boulevard from I-15 via US-93 (Exit 64). Effects to local traffic patterns are discussed by road type and at intersection level.

**Interstate 15.** Workers and delivery drivers would both use I-15 as the primary access route to the Proposed Project via US-93 (Exit 64). Since the Proposed Project is off of North Las Vegas Boulevard, an increase in traffic volume would occur on I-15, US-93 just east of I-15 southbound ramps, and North Las Vegas Boulevard, as these are the predominant roads that would be used to access the site. Even a maximum (worst-case scenario) of 876 additional vehicle trips per day would not degrade the LOS on I-15, US-93 and North Las Vegas Boulevard, as the LOS values at all of these locations are currently at acceptable conditions (LOS B or better). The addition of a maximum of 876 trips entering and exiting the site during peak commute times would not further degrade traffic flow on I-15 and associated on/off-ramps, which are currently operating at LOS B or better (see Tables 3-21 and 3-22 in Section 3.11.6.2, Major Traffic Routes within or adjacent to the Proposed Project).

*2. Produce an exceedance, either individually or cumulatively, of a level of service (LOS) standard established by the local county congestion management agency*

**Local Arterial Roadways.** After exiting I-15, vehicles would access the site using local arterial roadways, US-93 and North Las Vegas Boulevard. Local road conditions are currently acceptable (LOS ranging from A to B), and the addition of a maximum of 876 vehicle trips would also not likely result in a substantial effect on LOS for the segment of US-93 between I-15 and North Las Vegas Boulevard and on North Las Vegas Boulevard. The Proposed Project would result in short-term effects on traffic volume and would not adversely affect traffic flow on local roadways during peak construction.

**Intersections.** There are three, two-way, stop-controlled intersections on US-93 - US-93 at I-15 Northbound Ramps, US-93 at I-15 Southbound Ramps and US-93 at North Las Vegas Boulevard - that the vehicles would pass through to access the Proposed Project. Currently, the approach LOS (ranging from A to B - see Table 3.13-5 in Section 3.13.2, Major Traffic Routes within or adjacent to the Proposed Project) of the two-way, stop-controlled intersections is acceptable. With the addition of a maximum of 876 vehicle trips, the intersection approaches at the above-mentioned intersections would still operate at acceptable LOS (LOS D or better). The analysis also suggests that there could be some queue build up along the southbound approach of the intersection of US-93 at North Las Vegas Boulevard, which would eventually dissipate without much delay as the mainline traffic along US 93 is not significant. The Proposed Project would result in short-term effects on traffic volume and would not adversely affect traffic flow at intersection level during peak construction.

*3. Degrade existing road conditions as a result of construction*

Given the high numbers of vehicle trips per day (maximum of 876) along with the movement of heavy construction equipment, it is reasonable to anticipate that construction of the Proposed Project could damage public roads through increased use. Impacts to local streets would likely occur during the construction phase of the Proposed Project, as only minor vehicle use is anticipated during O&M and decommissioning. The Proposed Project is in a relatively undeveloped area, and it is anticipated that Proposed Project construction would not result in any short-term effects to access or road conditions; however, any unanticipated short-term effects on access and/or road conditions would be reduced by implementing mitigation measures outlined in Chapter 5.

**Operation and Maintenance**. O&M of the Proposed Project may result in a long-term increase in traffic volume of up to 90 trips per day (for 35 staff, 5 visitors and 5 delivery trucks, including morning and evening trips). There would be additional irregular increases in traffic volume due to scheduled and unscheduled maintenance. Additional traffic volume generated during O&M would be a long-term increase in traffic volumes but would not decrease or disrupt existing primary access to public roads throughout the area, nor would it affect the LOS.

**Decommissioning.** Typical activities during decommissioning would include facility removal, breaking concrete pads and foundations, removal of access roads that are not maintained for other uses, and revegetation of the site. Short-term increases in the use of local roadways would occur during the decommissioning period from the transport of heavy equipment and labor force. Heavy equipment would remain at the site until reclamation was completed. The labor force would be expected to add no more than 24 trips per day to local roads (assuming 12 people driving to and from the site). Overweight and oversized loads could cause short-term disruptions to local traffic.

#### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Under Alternative I, the traffic pattern would not change as compared to the Proposed Project as the vehicular traffic will still exit at US-93 (Exit 64) of I-15 to access the Proposed Project via North Las Vegas Boulevard. Therefore, effects under Alternative I would be similar to those identified under the Proposed Project and the same mitigation would be applicable.

#### No Action Alternative

Under this alternative, there would be no construction; therefore, there would be no effect on transportation or motorized vehicle access.

### 4.11.8.3. Residual Effects

Under all action alternatives, there would be short-term and long-term increases in traffic volume that could not be eliminated completely through mitigation. Both short-term and long-term increases would not be likely to affect the LOS at any of the roadway segments in the area.

## 4.12. Special Management Areas

This section discusses effects of the Proposed Project on Special Management Areas that would result with implementation of the Proposed Project or alternatives. The indicators used to identify and analyze effects are presented.

### 4.12.1. Indicators

The Proposed Project would affect Special Management Areas if it would:

- Restrict public access to Special Management Areas or Wilderness Areas;
- Impact desert tortoise populations in nearby DWMAs;
- Cause changes in air quality or other air clarity evaluations that could occur within SMAs in the area due to construction and operation activities;
- Conflict with the visual resource management (VRM) classifications of SMAs in the area having VRM classifications; or

- Cause changes to the darkness of the night sky dome as viewed from SMAs in the area due to construction and operation activities.

### 4.12.2. Direct and Indirect Effects by Alternatives

This section describes effects under each alternative following the requirements described under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

#### The Proposed Project

The Proposed Project is located approximately 7 miles west of the Valley of Fire State Park, 7 miles southeast of the Moapa Valley National Wildlife Refuge, 10 miles north of the Muddy Mountains Wilderness Area and 10-13 miles east of the Arrow Canyon Wilderness Area.

1. *Restrict public access to Special Management Areas or Wilderness Areas*

The Proposed Project is located almost entirely upon the Reservation, not accessible to the general public. There are no through roads associated with the placement of the Proposed Project upon the mesa adjacent to I-15. The Proposed Project will not restrict access, by the public, to SMAs or Wilderness Areas.

2. *Impact desert tortoise populations in nearby DWMAs*

Areas of Critical Environmental Concern are areas designated by BLM where special management attention is needed to protect and prevent irreparable damage to unique natural values, or to protect human life and safety from natural hazards (BLM 2009b). Natural values include, but are not limited to, historic, cultural, scenic, and wildlife resources.

The southern boundary of the 151,360-acre Mormon Mesa ACEC is located 7.5 miles northeast of the Proposed Project. The Coyote Springs ACEC is located 19 miles to the west, and the Gold Butte ACEC is located 18 miles to the east. All three ACECs were established specifically for the management of desert tortoise habitat and recovery of the desert tortoise (BLM 1998).

All desert tortoise relocation will take place within the Reservation and will not impact outside ACECs or listed DWMAs.

3. *Cause changes in air quality, conflict with visual resources or change the darkness of the night sky dome with respect to SMAs*

The nearest SMA or similar natural area is approximately 7 miles from the Proposed Project. Water trucks would be used during construction to minimize and control off-site dust pollution. The surrounding mountains and extensive topographic relief inhibits any visual impact from nearby natural areas. The construction of the Proposed Project would mostly take place during daylight hours between 7a.m. and 7p.m. Operations and Maintenance lighting will be minimal and located at the O&M building and potentially at major street entrances. All lighting will be directed in a downward manner to avoid light pollution. Given the distance to the nearest SMA or natural area, as well as mitigation measures in place during construction and O&M, The Proposed Project is not expected to have impact on visual resources of any kind.

#### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Alternative I would be constructed within the Proposed Project footprint with the exception of the alternative up to 500kV transmission line. The alternative transmission line would be placed between the existing utility corridor and Union Pacific railroad ROW. Alternative I would not result in any additional impacts to any SMAs as compared to those caused by the Proposed Project.

#### No Action Alternative

Under this alternative, there would be no construction; therefore, there would be no effect on SMAs.

### 4.12.3. Residual Effects

There would be no residual effects to SMAs as a result of the Proposed Project or alternatives.

## 4.13. Visual Resources

This section discusses effects of the Proposed Project on visual impacts that would result from implementation of the Proposed Project or alternatives. Indicators used to identify and analyze effects are presented.

### 4.13.1. Indicators

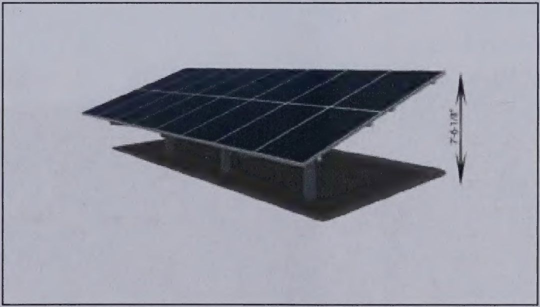
This section discusses effects of the Proposed Project on visual resources that may occur from implementation of the Proposed Project or alternatives. Using the BLM Visual Resource Manual H-8410-1, this assessment considered the regional visual character, visual resources of the Proposed Project, views of the Proposed Project from important vantage points, and changes in these views that would result from Proposed Project implementation. Indicators used to identify and analyze effects are presented.

The Proposed Project would affect visual resources if it would:

- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Impact areas of public concern for scenic quality such as: recreational areas, natural areas, wilderness areas, wilderness study areas, wild and scenic rivers, scenic areas, scenic trails, and areas of Critical Environmental Concern (ACEC);
- Have a substantial effect on a scenic roadway;
- Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway; or
- Create a new source of substantial light or glare that would affect day or nighttime views in the area.

### 4.13.2. Simulation Modeling

A visual simulation was prepared for each KOP using computer modeling techniques to depict the view as it would appear with the Proposed Project completed. A combination of computer aided drafting, GIS, and rendering programs were used to produce the images of the project facilities that are superimposed on photographs (below). To produce the simulations, a digital site model was created using DEM and site topographical data. Next, three-dimensional (3-D) models of project features were prepared using typical plans, and these were superimposed on the digital site model. The solar module simulation used has a maximum height of 7-foot, 6-inches See picture below). For each KOP, viewer location was digitized from Global Positioning System (GPS) captured altitude data, using 1.5 meters (5 feet) as the assumed eye level. Computer "wire frame" perspective plots were overlaid on the photographs of the KOPs from the simulation viewpoints to verify scale and viewpoint location. Digital visual simulation images were produced based on renderings of the 3-D model combined with the high-resolution digital base photographs.



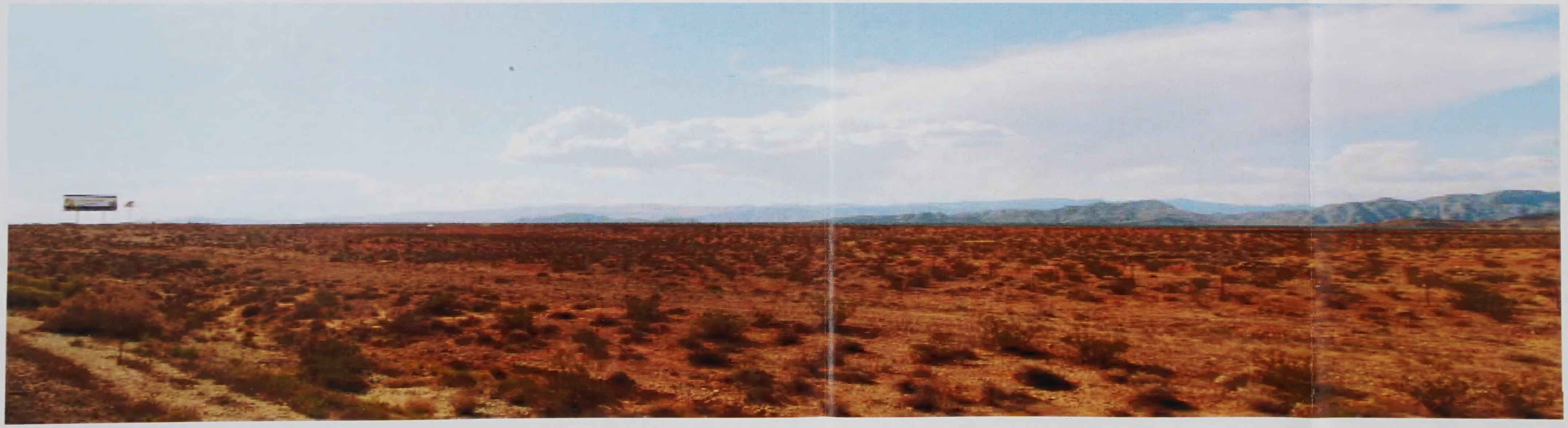
Preliminary simulation work indicated that the Proposed Project is only viewable from KOP 4 and 5. The solar field would be relatively visible (50%) given KOP elevation and rolling terrain of the solar facility site. The field would only be visible for 1-2 seconds at his location traveling at an assumed speed of 75 mph in the southbound direction. The solar facility is lost from view as adjacent hillsides or mounds caused by I-15 construction block the view to the west. The solar facility is elevated and near the horizon from KOP 5 and therefore only appears as a grey or grey/black line in the middleground. Photographic renderings are found below.

### 4.13.3. Visual Contrast Rating

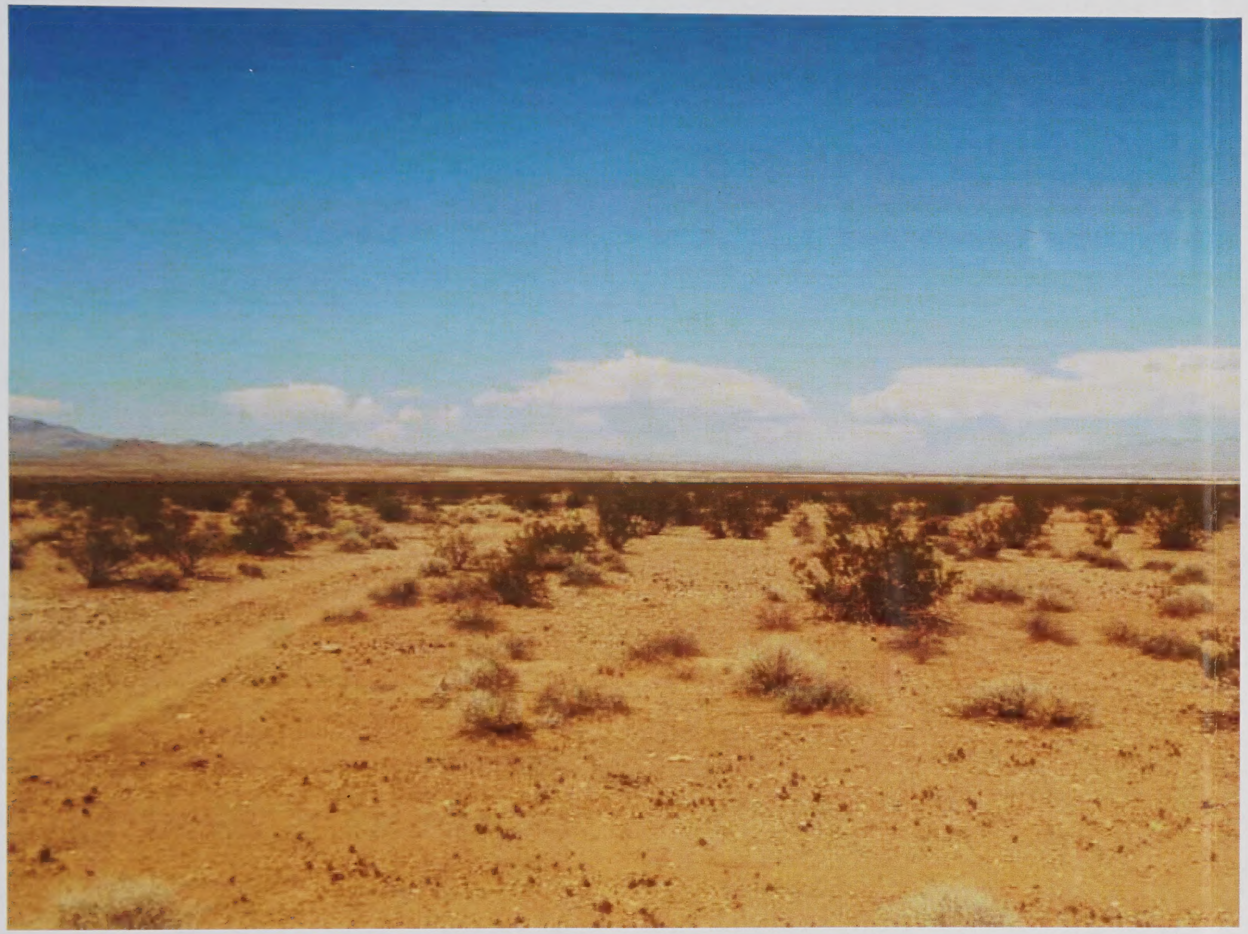
To assess the existing visual quality of the views from the KOPs and to establish the degree to which the Proposed Project would alter visual quality levels, the images were rated using BLM's methodology. BLM Visual Contrast Rating Worksheet Form 8400-4 was completed for each KOP (Appendix H). Sections A, B, and C were completed to document the existing environment and the changes to the existing environment resulting from the implementation of the Proposed Project.

Impact assessments were conducted for each KOP using a visual resource contrast rating worksheet that documents the comparison of the existing landscape with the way the landscape would appear following construction of a Proposed Project. The worksheets for each KOP include descriptive text and photographs documenting the existing landscape at the KOP and a photographic simulation of the Proposed Project.

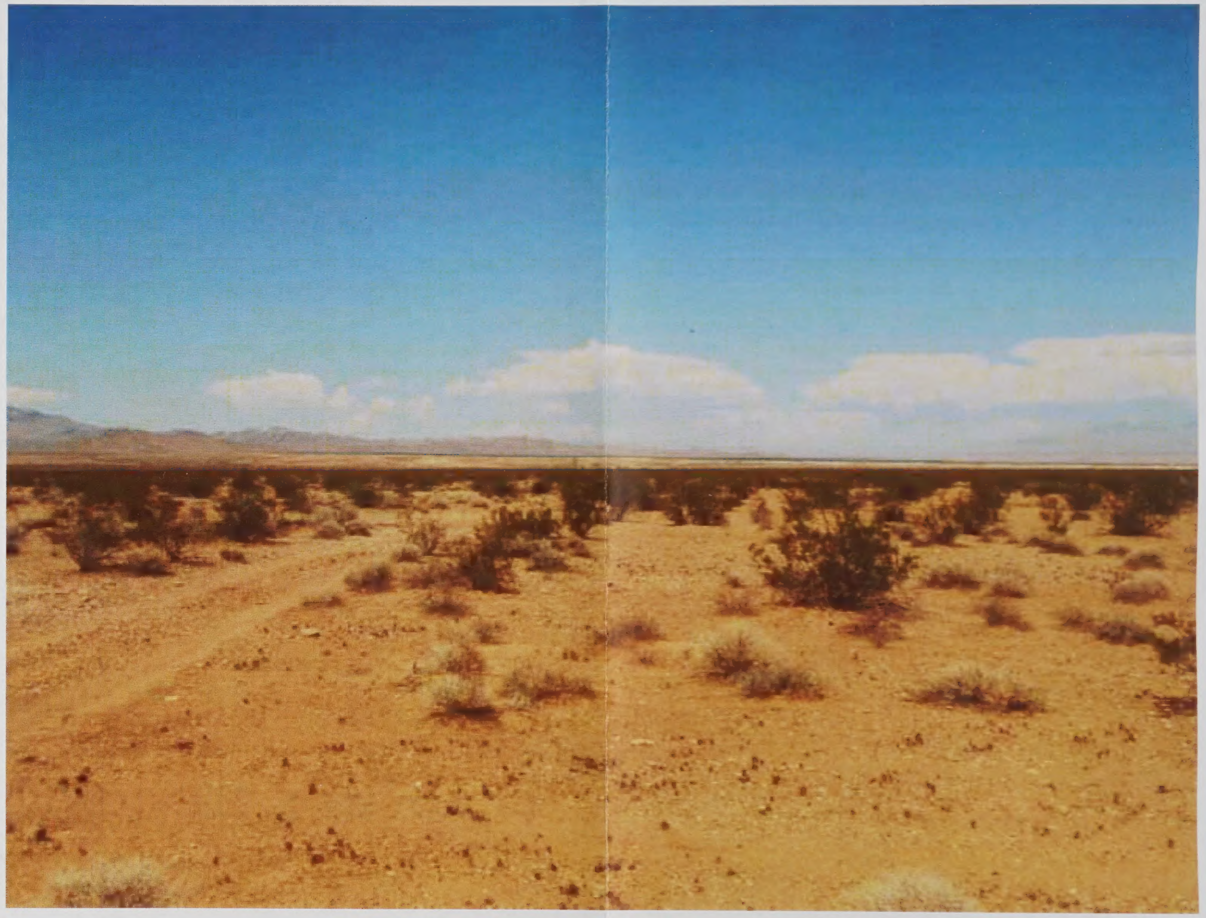
KOP 4 current viewshed



KOP 4 photographic rendering with Proposed Project



KOP 5 current viewshed



KOP 5 photographic rendering with Proposed Project

## 4.13.4. Direct and Indirect Effects by Alternatives

### The Proposed Project

The Proposed Project is located approximately 0.25 miles west of I-15. The terrain rises rapidly from I-15 to the mesa on which the Proposed Project is located. The terrain is relatively flat in some places while other areas exhibit topographic relief. The land to the north of the Proposed Project is within the Reservation and is approximately 50 feet lower in elevation than the mesa. Vegetation is composed predominantly of low, widely-spaced shrubs characteristic of the Mojave Desert. The Arroyo Canyon Range Mountains are visible in the background beyond the Proposed Project from I-15. The dominant man-made visual feature from I-15 will be the solar panels. Other features of the facility will not be easily discernible due to the terrain and the distance from the interstate as well as the multiple transmission lines within the BLM utility ROW. Other man-made features in the Proposed Project include fences and up to five transmission lines ranging from 250kV to 500kV in size. The existing utility corridor that traverses the Proposed Project from the southwest to the northeast is approximately 4,000 feet wide.

1. *Substantially degrade the existing visual character or quality of the site and its surroundings*

The Proposed Project is in a restricted area that is not accessible to non tribal members or the general public with special permissions; therefore, there is a low amount of land use, if any, by the public (no parks or recreational areas). As described in Section 3.12, there were four KOPs identified based on public travel routes, viewshed analysis, and user groups Existing views of the Proposed Project are limited, available specifically from I-15 and Route 40. Due to the flat topography of the Proposed Project and the surrounding topographical features such as the mesa and mountains, besides the existing transmission lines located within the existing utility corridor, the Proposed Project is not readily visible from many vantage points in the surrounding area.

The Proposed Project is visible from I-15 traveling southbound; however, the view is intermittent (3-5 seconds) at an assumed speed of 75mph. When traveling northbound on I-15 there is no view of the Proposed Project. Furthermore, the Proposed Project is visible from mile marker 8 through 2 while travelingwest on Route 40, from the Valley of Fire State Park. The elevation of the mesa would cause one to lose view of the Proposed Project once nearing the Travel Plaza.

Construction impacts on visual resources would include interruption of normal, however limited views of the Proposed Project site through the placement of staging areas, construction offices, construction fencing and construction vehicles. Areas of bare soil may be temporarily exposed or covered with erosion control fabric. Stockpiled materials, including dirt, riprap, roadbed materials and landscaping materials would likely be visible to travelers. All of these visual construction impacts would be temporary and removed upon completion of a given phase of construction.

The proposed transmission line corridor will be located within a designated utility corridor. The transmission line will be similar in structure and in pole structure placement (parallel) to the existing transmission facilities located within this corridor; therefore, the visual resources of the Reservation would not be noticeably altered due to the repeated nature of the poles and similar lines, color and structure. Secondary, pull-outs will be constructed perpendicular to the existing utility road to construct the transmission towers and maintain them; similar to what is currently used in the utility corridor. Because the proposed transmission line would be similar to existing facilities and the corridor is designated for such use, implementation of the Proposed Project would not substantially degrade the existing visual character or quality of the site and its surrounding viewshed.

The 350MW solar photovoltaic field would be contained within the 2,000-acre solar facility boundary. At the present time the exact design of the solar arrays has not been determined, although according to the Applicant's Draft Plan of Development, it would consist of approximately 1,600 acres (Figure 4-2). The solar panels, accompanying transformers, and fencing would be observed from the nominal viewpoints mentioned previously. However, the solar panels are of a fixed nature and placement is low to the ground; hence, they will not obstruct views.

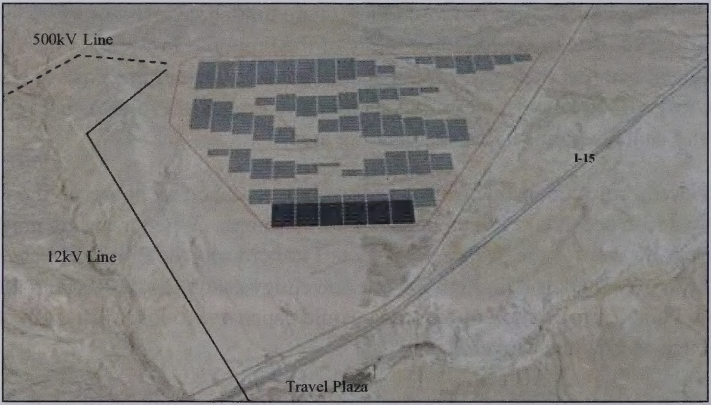


**Figure 4-2: Solar Panel Layout, Bird's Eye View**

The 12kV transmission line proposed for the Travel Plaza would run parallel to an existing unimproved road. The 12kV line would provide the Tribe with the opportunity to connect the Travel Plaza to the utility grid via equipment associated with the Proposed Project. Currently the Travel Plaza does not have access to the grid and it is powered with diesel generators. This line will be small in comparison, have wooden poles, and cross over or under I-15. This line would be visible to persons at the Travel Plaza as well as motorists as they pass by exit 75. Because there are transmission lines present in the area, this additional transmission line would not have a significant impact on visual resources.

The Proposed Project is not adjacent to any national parks or residential communities. Although the site will be located along a major highway, the flat topography of the Proposed Project and the surrounding topographical features such as the mesa and mountains, conceal the Proposed Project from many viewpoints within the surrounding area. Thus, development of the Proposed Project would not substantially degrade the existing visual character or quality of the site and its surroundings and no direct or indirect effect with regard to this resource is anticipated.

2. *Impact areas of public concern for scenic quality such as: recreational areas, natural areas, wilderness areas, wilderness study areas, wild and scenic rivers, scenic areas, scenic trails, and areas of Critical Environmental Concern (ACEC).*

The Proposed Project is in a restricted area that is not accessible to the general public; therefore, there is a low amount of land use, if any, by the public. The site is not used as a Nature Area, Wilderness Area or Wilderness Study Area, nor are there any Wild or Scenic Rivers present. Consequently, development of the Proposed Project would not have a substantial direct or indirect effect on areas of public concern for scenic quality. The solar facility may be viewed from the Old Spanish National Historic Trail, however, intermittently and at distance of 2-3 miles. Visual assessments near the Old Spanish National Historic Trail confirm that there is limited visual disturbance due to elevation of the solar facility upon the mesa and actual distance to the site. The solar facility is well in the middleground to background and of similar elevation having no significant contrast from the surrounding landscape.

3. *Have a substantial effect on a scenic roadway.*

The Proposed Project is not located in a designated scenic roadway. None of the roadways abutting or surrounding the Proposed Project are designated or proposed scenic roadways as determined by the Nevada Department of Transportation. Therefore, development of the Proposed Project would not have a substantial direct or indirect effect on a scenic road. No significant impact to this issue area is anticipated.

4. *Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.*

There are no historic structures or scenic resources, including trees or historic buildings, currently present on the Proposed Project site. There are mountain ranges and rock outcroppings in the distance surrounding the Proposed Project; however, the Proposed Project will interfere little, if at all, with the surrounding viewshed. In addition, there are no designated scenic highways surrounding the Proposed Project nor is the Proposed Project visible from any scenic highway. The Proposed Project would not substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway and is not expected to directly or indirectly affect scenic resources or any state scenic highway.

The Arrow Canyon Mountain Range and Muddy Mountains are both listed as scenic wilderness areas. However, due to the distance from the Proposed Project and flat topography of the land within the Proposed Project, the project site is not readily visible from the wilderness areas. Although transmission lines could be visible along portions of the wilderness areas, the proposed transmission lines would be within the same existing utility corridor; equivalent in use and scale as the existing lines and transmission facilities in the area and, therefore, would not substantially damage scenic resources.

5. *Create a new source of substantial light or glare which would affect day or nighttime views in the area.*

#### Light

The Proposed Project is located on the Reservation. There is currently no source of light or glare within the Proposed Project. Lighting will be primarily in the area of the operations and maintenance (O&M) building as well as transmission towers (if over 100 feet). Lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be downward facing and shielded to focus illumination on the desired areas only. As such, the Proposed Project is not anticipated to create a new source of substantial light which would adversely affect day or nighttime views in the area and would not impact users of the area (e.g., campers, stargazers, and recreational users of the desert). Therefore, there are no direct or indirect impacts of a new light source that would affect day or nighttime view in the area.

#### Glare

Proposed photovoltaic modules are non-reflective and convert sunlight directly into electricity. Furthermore, the Proposed Project would not use materials such as fiberglass, or vinyl/plastic siding and brightly painted steel roofs, which have the potential to create on-and off-site glare. Therefore, future development of the project site is not anticipated to create a new source of glare that would adversely affect day or nighttime views in the area.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Alternative I is a reduced footprint alternative within the Proposed Project solar facility boundary as well as the use of an alternative up to 500kV ROW. Visual impacts of the solar facility would be the same or potentially less than the Proposed Project as Alternative I is approximately 500 acres smaller in size. The proposed transmission line corridor will be located equidistant between the designated utility corridor and the Union Pacific railroad ROW making it more visible to motorists on I-15 as well as being more visible at a distance from various angles. Due to the placement of the alternative transmission line corridor, Alternative I could have a greater impact upon visual resources.

### No Action Alternative

Under this alternative, there would be no construction; therefore, there would be no impact to visual resources.

### 4.13.5. Residual Effects

No mitigation measures are proposed. Therefore, the residual impacts would be the same as the impacts described above.

## 4.14. Public Health and Safety

This section discusses effects on human health and safety due to exposure to or creation of hazards that may occur with implementation of the Proposed Project or alternatives. Criteria used to identify and analyze effects are presented, potential effects are discussed, agency-recommended mitigation measures are presented, and a discussion of residual effects is provided.

### 4.14.1. Indicators

Under NEPA, significant effects to health and safety would occur if the Proposed Project would:

- Use, store, or dispose of petroleum products and/or hazardous materials in a manner that results in a release to the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material or creates a substantial risk to human health;
- Mobilize contaminants currently existing in the soil or groundwater, creating potential pathways of exposure to humans or wildlife that would result in exposure to contaminants at levels that would be expected to be harmful;
- Expose workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal Occupational Safety and Health Administration (OSHA) in 29 CFR §1910, or expose members of the public to direct or indirect

contact with hazardous materials from the Proposed Project's construction or operations; or
- Expose people residing or working in the Proposed Project vicinity or structures to safety hazards and/or a significant risk of loss, injury, or death.

### 4.14.2. Direct and Indirect Effects by Alternatives

This section describes effects under each alternative following the requirements described under NEPA. To compare effects, this analysis defines temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Analysis of direct and indirect effects focuses on potential effects on public safety due to exposure of the general public, workers, and the environment to hazards and hazardous materials.

The primary mechanisms of potential exposure to human health and safety hazards considered for this analysis include: improper handling or transport of hazardous materials; reasonably foreseeable but inadvertent spills or releases of hazardous materials; soil and groundwater disturbance on sites with known and unknown contamination; and electrical and fire hazard.

#### The Proposed Project

The following discussion identifies potential direct and indirect effects from construction, O&M, and decommissioning of the Proposed Project. Construction and operation activities of the Proposed Project would take place almost entirely on the Reservation and within the existing, and developed, BLM utility corridor. Potential safety risks associated with Proposed Project phases range from accidental spills or releases of hazardous substances, mobilization of existing contamination, handling and disposal of hazardous materials, and potential exposure to electrical, flood, and fire hazards.

The Applicant is required by EPA regulations to develop a SWPPP to mitigate potential soil erosion and assist with the management and protection of water resources throughout construction and the operational life of the Proposed Project. The Applicant is required by federal regulations to develop a SPCC Plan to reduce the risk of releases of oil and hazardous substances to the environment during operations. Specifically, the Applicant would be required to have a SPCC Plan because the Proposed Project would store over 25,000 gallons of mineral oil in the transformers, diesel and gasoline for vehicle operations, and other chemicals for construction and operations.

The Applicant would incorporate the following Plans and adhere to the following standards to minimize risk and exposure to on-site staff, delivery personnel, construction workers, and off-site persons, the closest being visitors to the Travel Plaza located across I-15, west of the Proposed Project. The nearest community is approximately 10 miles north of the Proposed Project and is not at risk.

### General Design and Construction Standards

The Applicant would design the Proposed Project in accordance with federal and industrial standards including the American Society of Mechanical Engineers (ASME), National Electrical Safety Code (NESC), International Energy Conservation Code (IECC), International Building Code (IBC), Uniform Plumbing Code (UPC), Uniform Mechanical Code (UMC), the National Fire Protection Association (NFPA) standards, and OSHA regulations.

The Applicant would also comply with federal regulations and industrial standards for activities mentioned above as they pertain to construction, as well as with applicable state and tribal codes. Local Clark County code will be considered by the Applicant on portions of the Proposed Project managed by or on BLM lands and would include meeting road specifications for Clark County.

### Health and Safety Program

The Applicant would require all employees and contractors to adhere to appropriate health and safety plans and emergency response plans. In addition, all construction and operation contractors would be required to operate under a health and safety program written and administered by the EPC contractor and that meets industry standards. All contractors would be required to maintain and carry health and safety materials including the MSDS of hazardous materials used on-site.

### Emergency Response Plan

The Applicant would prepare an Emergency Response Plan based on results of a comprehensive facility hazard analysis. In addition, specific response plans would be prepared for each identified hazard. Emergencies might include brush or equipment fires, transformer oil leaks or spills, attempted acts of sabotage, and airplane crashes. The Emergency Response Plan would assign roles and actions for on-site personnel and responders and would designate assembly areas and response actions.

### Hazardous Waste Storage Plan

The Applicant would prepare a Hazardous Waste Storage Plan that would describe the storage, transportation, disposal, and handling of wastes and emphasize the recycling of construction wastes where possible. The plan would also identify the specific landfills that would receive construction wastes that could not be recycled. The Applicant would manage construction wastes in accordance with the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901, et seq. and RCRA's implementing regulations at 40 CFR 260, et seq.) and other applicable state and tribal regulations.

A project-specific hazardous materials management program will be developed as part of the Hazardous Waste Storage Plan prior to initiation of Proposed Project construction and operations. The program will outline proper hazardous materials use, storage, and disposal requirements. The program will identify types of hazardous materials to be used during construction and operations activities. A MSDS document control program shall be included within the Hazardous Materials Handling program to provide the necessary information on all chemicals stored and used on site. All personnel will be provided with project-specific training. This program will be developed to ensure that all hazardous materials are handled in a safe and environmentally sound manner. Employees will receive hazardous materials training and will be trained in: hazardous waste procedures; spill contingencies; waste minimization procedures; and Treatment, Storage, and Disposal Facility (TSDF) training in accordance with OSHA Hazard Communication.

1. *Use, store, or dispose of petroleum products and/or hazardous materials in a manner that results in a release to the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material or creates a substantial risk to human health*

During construction, operation and decommissioning on-site, delivery and off-site personnel could experience human health impacts as related to hazardous materials handling and spills.

**Construction**. The Proposed Project's construction activities would include work within and outside the perimeter fence area. Potential human health and safety effects due to use, transport, and disposal of hazardous materials during the construction process include: fencing of the Proposed Project, establishing laydown areas, constructing the proposed water line, constructing and upgrading access roads, preparing the solar site via clearing, grubbing and grading, construction of the substation and O&M area, constructing drainage control structures, installing overhead and underground transmission lines, installing PV equipment and installing the fire protection system.

Hazardous materials that may be used or come into contact with during these processes includes gasoline, diesel fuel, oil, hydraulic fuels and lubricants, paints, solvents, adhesives, batteries, welding materials, and mineral oil for transformers. During construction activities, localized spills and leaks of hazardous materials from equipment, storage sites or vehicles/equipment could occur as a result of improper handling or inadvertent spills, which could result in exposure to human or local wildlife. Transport of hazardous materials associated with construction would therefore pose only a minor risk to people or the environment. In addition, normal construction debris: wood, concrete, scrap metal, and cardboard will accumulate. Approximately 6,000 cubic yards of non-hazardous construction debris is anticipated during construction. This debris will be disposed of at an appropriate facility.

Construction personnel would be trained in the handling and storage of hazardous materials in compliance with OSHA standards. Minor spills on the Proposed Project could occur, but would be unlikely. A SPCC Plan to address hazardous materials management during Proposed Project construction will be developed. This plan would include a hazardous material inventory, emergency response procedures, training program information, and basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed. The SPCC would require a secondary means of containment in the case of an accidental release.

**Operations and Maintenance**. The O&M of the Proposed Project would involve the periodic use and transport of hazardous materials, hydraulic fluid, welding gases, and herbicides. In addition there would be one on-site, diesel-fueled backup firewater pump that would be located near the O&M building. Localized spills or releases of these hazardous materials could occur due to improper handling or storage or inadvertent release. These leaks or spills could result in contamination to soils. Since most structures would be located away from ephemeral washes and groundwater is expected to be very deep, it is highly unlikely that there would be contamination of surface water or water sources. Minor hazardous materials releases could occur due to improper handling and storage practices during operation and maintenance activities. Potential impacts related to such releases would be minimized by training personnel in the handling and storage of hazardous materials in compliance with OSHA and other applicable environmental health and safety standards. Additionally, a SPCC Plan to ensure proper storage and treatment of hazardous materials during operations will be developed. As a priority, and where feasible, wastes would be recycled and non-recyclables would be disposed of on a weekly basis at a permitted landfill. The hazardous waste would likely go to the nearest hazardous waste facility located 110 miles due west in Beatty, NV. Hazardous wastes would be generated over the life expectancy of the Proposed Project (up to 50 years or more) and would consists of lubricating oil, mineral transformer oil, oily rags, sorbents used for spill cleanup and empty hazardous materials containers. All of these hazardous materials would be recycled or disposed of at a certified recycler or according to the Hazardous Waste Storage Plan.

The Proposed Project at full build out may contain approximately 26,000 gallons of dielectric (mineral) oil on-site that would be prone to leaks or spill as a result of inadvertent damage from equipment, seismic event, fire or other unforeseen event. The Applicant proposes to install integral secondary containment at the substation, transformer locations, and chemical storage areas located within the designated O&M building to contain any such spills. A SPCC Plan would also be adhered to during operations.

**Decommissioning**. Decommissioning of the Proposed Project components could occur upon cessation of the ground lease or end of operations and eventual removal of all equipment and structures. The Proposed Project has an expected life of 50 years or more. Closure activities would have similar effects to human health and safety as construction activities. Handling, transport, and disposal of hazardous wastes would be encountered as a result of decommissioning. Demolition of structures, removal of transmission poles and all electrical components such as PV modules, as well as closure of wastewater facilities and the septic system could also affect human health and safety. The Applicant would develop a Site Restoration Plan for temporarily disturbed areas after construction and a Facility Decommissioning Plan for site closure activities to reduce impacts to human health and safety. Any modules that are not recycled would have to be disposed in compliance with all applicable federal, state, and local laws. For these reasons, the use of CdTe in PV modules for this Proposed Project would pose negligible risks to human health and safety and the environment.

2. *Expose human or ecological receptors to potentially hazardous levels of chemicals or explosives due to the disturbance or unearthing of contaminated soils or groundwater.*

The Proposed Project lies upon a mesa that is currently undeveloped and vacant land with no evidence of previous commercial or agricultural activity. The land was deeded to the Moapa Band of Paiute Indians in 1981 and the Tribe confirms that no potentially hazardous activity has taken place on or near the Proposed Project. Currently there is no evidence to suggest that on-site soils or groundwater are contaminated and, therefore, neither human nor ecological receptors would be exposed to potentially hazardous materials during construction, O&M or decommissioning activities.

3. *Expose workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal Occupational Safety and Health Administration (OSHA), or expose members of the public to direct or indirect contact with hazardous materials from the Proposed Project construction, operations or decommissioning.*

Construction, O&M, and decommissioning activities could temporarily expose workers to direct or indirect contact with hazardous materials. Workers who will handle hazardous materials are required under OSHA regulations to have a minimum level of training. Due to improper handling, workers could be exposed to hazardous materials above permitted levels. To address this potential hazard, the Applicant and/or contractors will implement a Health & Safety Program that would require all employees and contract staff to adhere to the appropriate health and safety plans and emergency response plans that meet industry standards.

4. *Expose people or structures to a risk of loss, injury, or death involving electrocution or excessive exposure to wildland fires, including where wildlands are adjacent to urbanized areas.*

**Construction**. During construction, the Proposed Project activities and related equipment could expose people to an increased risk of injury or death as a result of electrocution or exposure to wildland fires. The Proposed Project is a remote area, located approximately 10 miles south of the nearest residential/urban area. The threat of harm or loss to structures is low. The Community Hazard Assessment conducted by Clark County listed Moapa Town (located 10 miles north) as having "Moderate Fire Hazard." This rating was based on potential for strong fire behavior, limited water, and limited fire suppression resources.

Source of fire at the Proposed Project includes combustion of wildland fuels from smoking, refueling, and operating vehicles and other equipment off designated roadways. Scraping and grubbing of vegetation could also pose a risk if vegetation debris piles are left near welding areas. The Applicant's grading plans will direct that all vegetation collected be moved off-site to the nearby Moapa compost facility.

Portions of the Proposed Project are or will be located close to overhead powerlines and gas transmission lines. Construction of the Proposed Project could also expose workers to potential electrocution hazards. The Applicant would procure a contractor that is committed to designing the proposed electric system and components in compliance with the National Electric Code (NEC) and NESC, as well as other industrial safety standards, including OSHA. Hazards associated with the two natural gas pipelines will be mitigated by use of the "one call" system, using timber matting or similar padding for vehicle transport across the pipeline ROW, and having a Kern River technician on-site during construction.

**Operation and Maintenance**. O&M of the Proposed Project would increase the potential for additional incidents related to fire and fire safety. Petroleum products would be the main flammable substances to be used during Proposed Project operations. Combined with electrical arcing and sparking from exposed wiring within the PV module arrays and substation, a fire hazard would exist. To reduce this fire risk, a 20-foot wide firebreak would be constructed outside of the proposed perimeter fence. The firebreak would be maintained by discing, herbicide or frequent mowing. The facility would also have access to a fire suppression system kept at the O&M building that will be sourced by a 150,000-gallon water tank.

O&M of the Proposed Project would also expose workers to potential electrocution hazards from the electrically energized equipment. Protective measures and equipment for employees working directly with or near electrical equipment will be implemented. The proposed electrical system will be designed and built to NEC and other federal specifications.

**Decommissioning**. Decommissioning of the Proposed Project would involve similar risks of fire and electrocution as the construction phase. Removing, dissembling or demolition of all electrical equipment that may pose a fire or electrocution risk will be monitored and implemented according to the Facility Decommissioning Plan.

The Applicant has incorporated the following measures to help avoid or reduce impacts to public health and safety:

- SWPPP,
- SPCC Plan,
- Hazardous Waste Storage Plan,
- Restoration Plan and Facility Decommissioning Plan, and
- Environmental Clearance.

By properly implementing the above Plans, the potential for impacts to human health and safety would be minimal or non-existent.

### Alternative I: Reduced Solar Facility Footprint and Alternative 500kV Transmission Line

Potential human health and safety effects that would result from the construction, operation, and decommissioning of Alternative I would be identical to those identified for the Proposed Project. Components of the Proposed Project would be located within the same general area and expected construction techniques and timeframes would be similar.

### No Action Alternative

Under this alternative, the Proposed Project would not be constructed: therefore, there would be no project-related effects on human health and the environment.

### 4.14.3. Residual Effects

With proper implementation of the Applicant's design features and plans, and implementation of mitigation measures provided for additional prevention, management, and response of human health and safety hazards during construction, operation, and decommissioning of the Proposed Project, residual effects due to exposure of human or ecological receptors to hazards and hazardous materials are not anticipated.

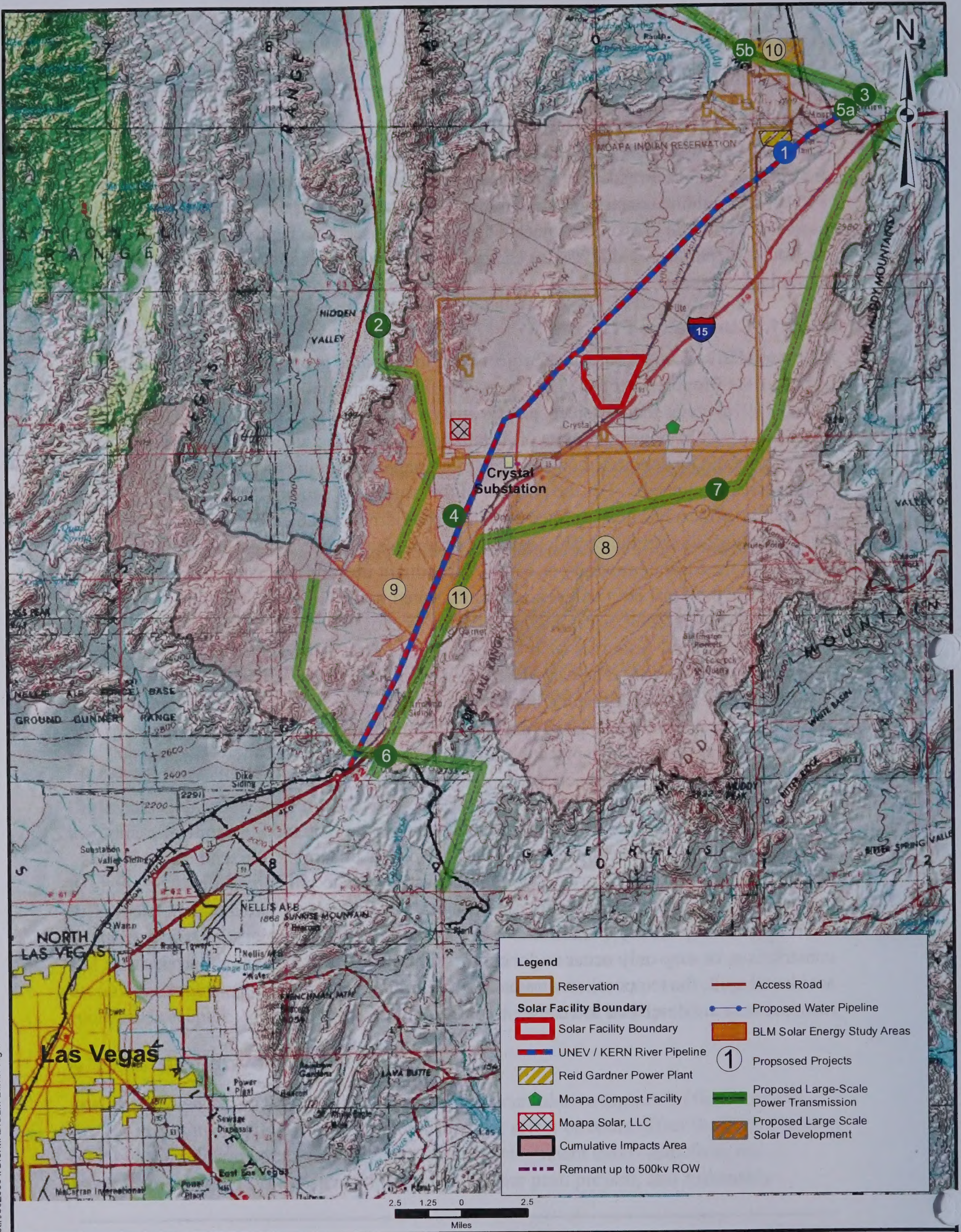
## 4.15. Cumulative Scenario

In accordance with NEPA, this document analyzes cumulative impacts of the Proposed Project in conjunction with other developments that affect or could affect the area. Under NEPA, a cumulative impact is the impact on the environment that results from the incremental impact of the project when added to other past, present, and reasonably foreseeable future actions (40 CFR Section 1508.7). In order to facilitate the cumulative analysis, a cumulative scenario has been developed that identifies and evaluates projects that are reasonably foreseeable and that already exist within the vicinity of the Proposed Project or would be constructed or commence operation during the timeframe of activity associated with the Proposed Project. The cumulative scenario is presented in this section; the cumulative analysis for each resource area is presented in Section 4.16, Cumulative Impacts.

### 4.15.1. Cumulative Projects

The cumulative scenario includes projects within the same geographic and temporal scope as the Proposed Project. The Council on Environmental Quality (CEQ) guidance (CEQ 1997a) states that "Project specific analyses are usually conducted on the scale of counties, forest management units or installation boundaries; whereas cumulative effects analysis should be conducted on the scale of human communities, landscapes, watersheds, or airsheds". For the purpose of this study, the geographic scope for cumulative effects has been defined as within the Garnett and California Wash watersheds for direct impacts (biological, cultural, water resources, air etc.) (Figure 4-3) and within the local community or county for indirect impacts (climate, socioeconomics, resource use patterns, etc.) unless specifically stated in the Geographic Extent summary Section. The geographic/watershed boundary was chosen based on potential significant impacts to particular resources such as biological, cultural and water. Given the nature of Proposed Project (solar / renewable energy), past, current and reasonably foreseeable projects outside of the geographic boundary would have no cumulative effect and therefore were not included. The Tribe has full authority to regulate any current or foreseeable projects that take place within the Reservation and, therefore, are able to manage local cumulative impacts with more certainty.

As with the geographic scope of the cumulative analyses, the temporal scope of each analysis varies by resource area. For the purpose of this document, the temporal scale has been limited to projects constructed within the last 5 years to projects that may be constructed within the next 10 years according to Tribe and agency sources. Impacts of the Proposed Project may be limited to a particular phase of the project, such as during construction, or may only occur under certain circumstances, such as in the event of an accidental spill; the temporal constraints of the cumulative impact analysis for each resource area are described in Section 4.16, Cumulative Impacts.


N
MOAPA INDIAN RESERVATION
Crystal Substation
1
2
3
4
5a
5b
6
7
8
9
10
11
15
HIDDEN VALLEY
NORTH MUDDY MOUNTAINS
MUDDY MOUNTAINS
NELLIS AIR FORCE BASE GROUND GUNNERY RANGE
GALE HILLS
NELLIS AFB
SUNRISE MOUNTAIN
NORTH LAS VEGAS
Las Vegas
Legend
Reservation
Solar Facility Boundary
Solar Facility Boundary
UNEV / KERN River Pipeline
Reid Gardner Power Plant
Moapa Compost Facility
Moapa Solar, LLC
Cumulative Impacts Area
Remnant up to 500kv ROW
Access Road
Proposed Water Pipeline
BLM Solar Energy Study Areas
Propsosed Projects
Proposed Large-Scale Power Transmission
Proposed Large Scale Solar Development
2.5 1.25 0 2.5
Miles

Map Document:Austin/6923001/GIS/MXD/BLM Lands Figure 1

MALCOLM PIRNIE

K Road Power
San Diego, California

K Road Moapa Solar Project

Moapa River Indian Reservation

Cumulative Impact Scenario

MALCOLM PIRNIE, INC.

February 2012

FIGURE 4-3

The cumulative scenario comprises all projects that are considered for any resource area. These include renewable energy projects, transportation projects, infrastructure improvement projects, pipeline and electric transmission projects, and other projects that meet the following criteria:

- Projects that are closely-related and completed past projects;
- Projects approved and under construction;
- Projects approved but not yet under construction; and
- Projects that have been proposed but not approved.

Projects are included in this cumulative analysis if information on the project was available in the BLM's GeoCommunicator mapping system, identified during agency scoping, or provided in consultation with the BLM, BIA and the Tribe.

### 4.15.2. Overview of Cumulative Projects

Through literature review, internet searches, industry reports and primarily through the application process required on BLM lands; the following projects were identified as past, current, or constructed in the foreseeable future within the geographic boundary of the cumulative effects areas. Small scale projects (less than 100 acres) are not described in detail; however, large scale projects have been identified in Section 4.15.3 where publicly available information was available. The large scale projects, specifically solar projects and other major projects directly adding to cumulative impacts are seen in Table 4-11. All other projects are grouped collectively according to industry (Table 4-12). The total cumulative impact acreage of all projects is approximately 32,820.52 acres. The Map ID's in the Table below correlate with Figure 4-3.

**Table 4-11.**
**Large Scale Projects Identified for the Cumulative Effects Analysis**

| Industry | Map ID | Name | Acreage |
|---|---|---|---|
| Other | 1 | NV POWER CO | 555 |
| Power Transmission | 2 | Southwest Intertie Project (SWIP) Idaho Power Company | 200 |
| Power Transmission | 3 | LINCOLN CNTY POWER DIST #1 | 951 |
| Power Transmission | 4 | RES AMERICA DEVELOPMENTS, INC. | 168 |
| Power Transmission | 5a & 5b | OVERTON POWER DIST | 760.39 |

**Table 4-11 Continued**

| Industry | Map ID | Name | Acreage |
|---|---|---|---|
| Power Transmission | 6 | SILVER STATE ENERGY ASSOCIATION | 882.42 |
| Power Transmission | 7 | TRANSWEST EXPRESS, LLC | 1454.55 |
| Solar Development | 8 | BRIGHT SOURCE ENERGY SOLAR PTNR | 2000 |
| Solar Development | 9 | COGENTRIX SOLAR SERVICES LLC (BLM Solar Energy Study Area) | 22870.90 |
| Solar Development | 10 | GA-SNC SOLAR, LLC | 825 |
| Solar Development | 11 | POWER PARTNERS SOUTHWEST LLC | 1751.44 |
| | | Total: | 32460.28 |

**Table 4-12.**

**Small Scale Projects Identified by Industry for the Cumulative Effects Analysis**

| Industry | Number of Projects | Acreage |
|---|---|---|
| Telecommunications | (3) | 11.07 |
| Mining | (3) | 95 |
| Oil and Gas Pipelines | (3) | 12.79 |
| Power Transmission | (4) | 14.33 |
| Recreation | (1) | 30 |
| ROW - Roads | (8) | 144.90 |
| Temporary Use | (2) | 9.83 |
| Water Facility | (7) | 35.72 |
| Wind (Project Test) | (1) | 0.06 |
| Other | (4) | 6.54 |
| Total: | (36) | 360.24 |

### 4.15.3. Large Scale Projects

#### 4.15.3.1. Existing or Recently Completed Projects

**UNEV Pipeline** UNEV is constructing and operating a 399-mile, 12-inch petroleum products pipeline that originates in Woods Cross, Utah with terminals northwest of Cedar City, Utah and near Apex, Nevada (northeast of Las Vegas). Two lateral pipelines are also proposed: One lateral would extend approximately 2.4 miles from the mainline to the Salt Lake City International Airport, and one would extend approximately 10 miles from the mainline to the proposed Cedar City Terminal. The southern-most 150 miles of the pipeline alignment (Milepost [MP] 250 to the Las Vegas Terminal) will generally follow the existing Kern River pipeline ROW, which contains two Kern River Pipeline Company natural gas pipelines, the newest of which was constructed in 2003. The Kern River Pipeline Environmental Impact Statement was completed in 2002. The Kern River and UNEV pipeline are or will be within the 4,000-foot BLM-managed utility corridor that traverses the Reservation. Permanent facilities will include access roads to all aboveground structures (including valves, launchers, and receiving equipment). Temporary facilities will include construction and equipment storage yards, extra workspace for pipe stringing, and additional construction access roads. The UNEV pipeline was constructed adjacent to the Proposed Project in Oct/Nov of 2011.

**Kern River Natural Gas Lines** This project, completed in 2005, incorporated expansion of the Kern River Gas Transmission Company natural gas pipeline system from one, 36-inch pipe to two, looped, 36-inch pipes. Portions of the pipeline ROW (particularly from Moapa Town south to Highway 93) are within the Cumulative Effect Area. The Project was completed in July 2003.

**Reid Gardner Coal Power Plant** (NV Power Company) Reid Gardner Station is a 4 unit, 557 peak MW coal fired power plant located on 480 acres in Moapa Valley, Nevada. The Muddy River crosses the site, as does Union Pacific Railroad's Las Vegas - Salt Lake City line. The plant is surrounded by BLM land to the north and south, Paiute agricultural land and residences on the west, and an inactive dairy farm on the east. The Reid Gardner Generating Station is a coal-fueled, steam-electric generating plant with four operating units. The first two nearly identical generating units went into service in 1965 and 1968. A third similar unit was added in 1976. The plant's largest generating unit is jointly owned by NV Energy and California Department of Water Resources. This 257-megawatt unit was commissioned in 1983 and uses a Foster Wheeler boiler to drive a Westinghouse turbine generator (NV Energy 2010).

Coal is brought in by rail from mines in Utah, Colorado and Wyoming. The water supply is taken from the Muddy River, and from a well field near its' headwaters, with 8,300 acre feet per year used for steam generation, cooling, emission control scrubbers, bottom ash transport, and dust control (NV Energy 2010). It is believed that an expansion to the plant may take place in the near future and result in impacts to 555 acres of additional land; however, not all expansion land would be un-disturbed and impacts would be localized to and around the existing plant and previously impacted areas.

**Moapa Compost Facility** Clark County has one permitted compost facility: A-1 Organics. In 2006, A1 Organics relocated its composting operation to the Reservation on the east side of I-15 near the Travel Plaza. The site receives wood, greenwaste, foodwaste, manure, and other organic materials. These materials are processed into compost, mulch, biomass for alternative energy uses (Reid Gardner Power Plant), and special soil blends for home and commercial uses. A Composting Facility is defined as "a facility designed and operated to receive raw or waste organic by-products and transform the material through biological processes into biologically stable organic material. The operation is small in size, has a small number of truck deliveries and is a beneficial development for the area. The Moapa Compost facility was not included in this cumulative impacts analysis.

### 4.15.3.2. Proposed Projects

**Moapa Solar LLC Project** This utility-scale concentrating solar power (CSP) project is proposed for the Reservation. The facility would produce up to 230MW of electricity. The project would be located in Township 16 South, Range 64 East, Sections 30 and 31. The solar facility would either use eSolar's CSP plant technology, or Areva's compact linear Fresnel reflector (CLFR) design, or a combination of both. The facility designs would likely include solar fields, central power towers, power blocks, buildings, a parking area, a construction laydown area, water treatment system, and evaporating ponds. A single overhead 230kV transmission line will connect the plant to the nearby Harry Allen 230kV Substation or the Crystal substation. An access road to the proposed project site would need to be constructed to provide access from the I-15 – Valley of Fire exit. The facility is expected to operate for approximately 25 to 30 years.

**Bright Source Solar** This potential project is proposed on 2000 acres of BLM land, with the project name of Apex/North East Las Vegas and is part of a large planned community. Recent research shows the project decreasing in size to 960 megawatts from a proposed 1,200 megawatts. The site is 55 miles northeast of Las Vegas, a 43,000-acre master-planned community in the midst of the east Mojave Desert in Lincoln and Clark Counties. Part of the electricity generated would go to California. Because of difficulties in securing enough water, BrightSource plans to make the plant dry-cooled, which would use about 67 million gallons of water per year. Little is known about this project and no public information is posted on the company's website.

**CoGentrix Solar Projects** The CoGentrix proposed solar projects are comprised of four separate projects proposed within the BLM solar energy zone located southwest and adjacent to the Reservation (Figure 4-3). These projects were submitted to the BLM in

2008 and have a total acreage of over 20,000 acres. Recent communication with the BLM suggests that these projects may be taken off the recently foreseeable list, however are being included for the purpose of this cumulative impacts analysis. No public information was found for these projects. Elimination of these projects would result in a reduction of cumulative impacts of over 20,000 acres.

#### 4.15.3.3. Foreseeable Projects

**TransWest 600 kV Transmission Lines** TransWest Express, LLC, has filed an application for a right-of-way to construct and operate a 600kV overhead direct current transmission line crossing public and private lands for the TransWest Express 600kV Project. The extra-high voltage line is designed to carry renewable power generated in Wyoming to the Desert Southwest.

The project begins in south-central Wyoming, crosses northwestern Colorado, crosses Utah diagonally from northeast to southwest and ends south of Las Vegas at the Marketplace hub in the Eldorado Valley area (near Boulder City, Nevada).

Western Area Power Administration (Western) plans to partially fund the project under the American Recovery and Reinvestment Act of 2009, and will be joint lead agency for the National Environmental Policy Act (NEPA) process. The project plans to provide 3,000 megawatts of capacity by 2015. The Proposed route is south and east of I-15 at the western edge of the Muddy Mountains and would not directly affect the Proposed Project.

**Southwest Intertie Project (SWIP)** Idaho Power Company (IPCo) is proposing to construct over 500 miles of single-circuit, 500 kilovolt (kV) transmission line between the existing Midpoint Substation near Shoshone, Idaho, and a newly proposed substation in Dry Lake Valley northeast of Las Vegas, Nevada. The transmission line project, known as the Southwest Intertie Project (SWIP), would be within the transmission line corridor adjacent to the Moapa Solar site.

**Power Transmission Lines (Lincoln City and Overton Power District)** These transmission line projects are proposed and have active applications for ROW at the BLM. Specific information other than general location are not know for these projects and no public data exists. Total acreage impact is estimated at 1,711.

Locations of the above-referenced projects are included in Figure 4-3.

## 4.16. Cumulative Impacts

In accordance with NEPA, this environmental impact statement analyzes cumulative impacts of the Proposed Project combined with other proposed projects or developments that would affect or potentially affect the area. For the purpose of this section the

Geographic Extent under consideration is shown in Figure 4-3 unless specifically stated for a particular resource.

The cumulative effect of the Proposed Project was not analyzed in resource sections where it was determined that the Proposed Project would have little to no impact before and after mitigation since the Proposed Project would not contribute to cumulative impacts to that resource. If the Proposed Project were rejected or not built (i.e., the No Action Alternative) there would be no impacts on the resources discussed in this section, nor would the No Action Alternative contribute to cumulative impacts; therefore, the No Action Alternative was not analyzed further as part of the cumulative impact analysis in this section.

### 4.16.1. Geology, Topography and Geologic Hazards

Cumulative impacts to geology and topography are not analyzed for the Proposed Project because the Proposed Project would not result in impact to geologic units or topography outside of the Proposed Project and, therefore, would not contribute to cumulative impacts to geology and topography.

Geologic hazards (such as ground shaking, earthquake-induced ground failure, and fault rupture) from local and regional faults are impacts of the geologic environment on individual projects and would not introduce cumulatively considerable impacts.

### 4.16.2. Soils

#### 4.16.2.1. Existing Cumulative Conditions

Local lands in Dry Lake Valley generally share the same desert soil characteristics as the Proposed Project. The adjacent lands are primarily rural, open spaces.

#### 4.16.2.2. Past, Present, and Reasonably Foreseeable Proposed Projects and Changes

Ongoing and foreseeable development throughout the cumulative effects area that would have an impact upon soil includes the following: UNEV petroleum pipeline, Moapa Solar, LLC Proposed Project, SWIP, TransWest transmission lines, Bright Source Solar, CoGentrix Solar and large scale electric transmission lines, as well as the recently developed Kern River Pipeline. With exception of the completed Kern River Pipeline, the other current or proposed projects could overlap in the construction period during which time soil impacts would be the greatest.

#### 4.16.2.3. Cumulative Impact Analysis

Construction of the Proposed Project would involve grading of the Proposed Project. Erosion could occur in these areas due to the removal of vegetation and soil exposure. The Applicant would implement a SWPPP to minimize the amount of any soil erosion during construction. The plan would include use of watering trucks to limit windblown erosion, leaving low vegetation in place where practical to avoid sheetwash, and use of stormwater controls to limit soil displacement off-site. Wind erosion would be exacerbated due to the removal and maintenance of vegetation within the Proposed Project, likely resulting in a localized loss of topsoil. Also, continuous placement of solar modules may alter the drainage characteristics of the site.

All other foreseeable construction projects in the cumulative effects area for soils would also be required by law to implement similar control measures under the NPDES program and implement BMPs similar to the Proposed Project to prevent erosion. However, the acreage affected by the other foreseeable projects would contribute to an overall cumulative impact to soil resources over the life of the Proposed Project. Given the assumed time frame for completion of the UNEV pipeline, TransWest transmission line, and Moapa Solar, LLC solar project, impacts to soil within the existing BLM utility corridor could be localized and have a significant cumulative impact to vegetation and off-site erosion. Presumed staging of these projects and proper BMPs as well as desert restoration plans could alleviate some of the cumulative and localized impacts within the corridor.

**Alternatives**

Alternative I would produce similar cumulative impacts given that the Proposed Project would be of similar size, and associated infrastructure would utilize a ROW adjacent to the existing utility corridor. Soil erosion arising from Alternative I might have less impact on topography and hydrology of the solar facility site due to reduced acreage impacts. The opportunity for large-scale erosion during heavy rains exists, even with properly designed stormwater controls.

### 4.16.3. Water Resources

This section discusses cumulative effects on water resources that may occur with implementation of the Proposed Project along with other potential proposed projects in the area. As stated in Section 3.4, the Proposed Project does not contain or drain to any wild and scenic river or Section 404 jurisdictional water; nor do any of the washes located on-site fall within the FEMA 100-year flood zone. Cumulative effects will mainly be focused on groundwater condition (i.e., quantity and quality).

#### 4.16.3.1. Existing Cumulative Conditions

Although there is some development in the area considered for cumulative effects to hydrology and water quality, the area is largely undeveloped currently.

### 4.16.3.2. Past, Present, and Reasonably Foreseeable Proposed Projects and Changes

Ongoing and foreseeable development throughout out the cumulative effects area for hydrology and water quantity and quality includes the following: UNEV petroleum pipeline, Moapa Solar, LLC Proposed Project, SWIP, TransWest transmission lines, Bright Source solar project and the remaining Lincoln County and Overton transmission lines.

### 4.16.3.3. Cumulative Impact Analysis

The potential for hydrologic and water quantity and quality impacts of the Proposed Project to be combined with effects from other proposed projects within the geographic extent of the cumulative analysis is described below.

#### Decrease Groundwater Supply

This section addresses the combined effects of decreasing groundwater supply or interfering substantially with groundwater recharge by the Proposed Project and past, present, and reasonably foreseeable proposed projects.

The Proposed Project will use approximately 72 AFY of water during construction, which amounts to approximately 290 AFY of water over the proposed, five-year construction period. The Proposed Project will require approximately 20-40 AFY of water during normal operations. The source of this water is an existing Reservation well that can produce 60 gpm of water (> 2700 AFY). There are no specific water demand data given for the proposed projects listed above; however Bright Source solar is a proposed CSP thermal project and requires a significant amount of water. The only piece of information known at this time is that the Moapa Solar, LLC proposed project might use at least twice the amount of water for operations (process) water and the UNEV project will rely on a nearby existing well for construction (dust suppression) purposes. The proposed solar projects are of equal or larger size and therefore would have a similar or increased demand for water. Depending on water demands and sources of these foreseeable, proposed projects, alternative wells will need to be brought online to accommodate total water demands.

The estimated perennial yield for California Wash Basin is 2,200 AFY and the committed use is 3,067 AFY. At this time, it is not known what sources of water would be used for the foreseeable projects; hence, it is not possible to assess the magnitude of the impacts. If total water demands from all foreseeable, proposed projects may be less than 7,000 AFY, and based on modeling results for the Calpine Company Moapa Paiute Energy Center proposed project, it is safe to conclude no foreseen cumulative impacts to groundwater would result (PBS&J 2001). It is also expected that the foreseeable projects would be constructed on the Reservation or on BLM lands in which Section 7

Consultation with the USFWS would take place to determine cumulative impacts to groundwater and associated biological concerns.

The amount of water used for the Proposed Project would be small in comparison to the Calpine proposed project and would not alter groundwater volume within the local basin; therefore, it would not contribute to a considerable cumulative impact under this criterion.

The Proposed Project would result in a maximum of 1400 acres (2.18 square miles) of semi-impervious surfaces. The Proposed Project would be in the California Wash groundwater basin, which covers 318 squares miles and is largely undeveloped. The area covered by the semi-impervious surfaces of the Proposed Project would be 0.07 percent of the basin. As there is little information known about the other foreseeable, proposed projects, it is not possible to conclude whether there would be significant cumulative alteration of groundwater recharge locally. However, the area of new semi-impervious surfaces of the Proposed Project would be small in comparison to the size of the recharge area and would not alter groundwater recharge within the local basin, so it would not contribute considerably to a cumulative impact.

### Degrade Groundwater Quality

This section addresses combined effects of the Proposed Project and similar impacts of past, present, and reasonably-foreseeable, proposed projects on degradation of groundwater quality such that it is no longer suitable for its intended use.

Although hazardous material spills can occur on any construction site, the Applicant would implement multiple programs and measures to reduce potential for a spill and to address spills that occur. These include emergency release response procedures to address any potential release of hazardous materials.

All foreseeable construction projects would also be required by law to implement a SWPPP and would likely have the same type of hazardous materials management programs as the Applicant. All other foreseeable proposed projects that would have aboveground oil storage capacity greater than 1,320 U.S. gallons, or completely buried oil storage capacity greater than 42,000 U.S. gallons, would be required by law to implement a SPCC plan.

With successful implementation of spill prevention measures, any release from either the Proposed Project or any foreseeable, proposed project would have short-term and localized effects. Given the depth to groundwater in the area and requirements for spill prevention and cleanup, considerable cumulative impacts to water quality would not be likely. Therefore, it is unlikely that there would be a significant cumulative impact to water quality that would result in degradation of groundwater.

### 4.16.4. Air Quality and Climate

Air quality impacts resulting from the Proposed Project would occur within the California Wash (HA 218). The operational phase of the Proposed Project will have minimal emissions of regulated air pollutants; thus, this cumulative impact discussion will focus on the impacts associated with the construction phase. Due to the localized impact of construction emissions, this analysis includes proposed projects that would be in close proximity to the Proposed Project. Emissions could also be generated from the following proposed sources in the area:

- Reid Gardner Coal Power Plant and NV Power expansion – Existing coal fired power plant 9 miles north of the Proposed Project.
- UNEV Pipeline – UNEV Pipeline, LLC is proposing to construct and operate a 399-mile petroleum products pipeline that would run through the utility corridor associated with the Proposed Project;
- Moapa Solar, LLC – proposing to construct a 230MW CSP solar energy facility on the Reservation, south of the Proposed Project;
- Southwest Intertie Proposed Project (SWIP) – Idaho Power Company (IPCo) is proposing to construct over 500 miles of single-circuit, 500 kV transmission line. The SWIP would be within the transmission line corridor adjacent to the Proposed Project or would parallel highway 93 and traverse the Reservation southwest of Crystal Substation;
- TransWest 600kV direct current transmission line that may be constructed through a proposed north/south corridor south and east of I-15 and the Proposed Project; and
- Bright Source Solar – is proposing an up to 1,200 MW solar plant within a 43,000 acre planned community south of the Reservation.

All effects on climate change caused by the release of GHG emissions are cumulative by nature and GHG emissions related to the Proposed Project are minimal. Operation of the proposed solar plants will provide electricity from renewable energy sources (i.e., virtually emissions-free) for an extended period of time. Fossil fuel equipment associated with construction activities will account for a majority of the GHGs associated with the Proposed Project. Cumulative impacts are not analyzed because the Proposed Project is a source of renewable energy and will have negligible GHG emissions.

#### 4.16.4.1. Existing Cumulative Conditions

The Proposed Project will be constructed on the Reservation located in Clark County, Nevada. The proposed location is located within HA 218, which is found in the Mojave Desert Air Basin. The regulatory agency responsible for this area is the Clark County Department of Air Quality and Environmental Management (DAQEM) or EPA on Reservation land. The Proposed Project is located in an area designated as an ozone ($O_3$) non-attainment area; however, the Reservation is not included in the non-attainment status. Current ambient air quality concentrations were included and described in detail in Section 3.5, Air Quality. Since the Proposed Project will be located in an area designated as ozone non-attainment, any significant increase in emissions of $O_3$ (or its precursors, VOC and NOx) would potentially impact air quality; however, that impact is not anticipated to significantly impact or change cumulative conditions.

#### 4.16.4.2. Reasonably Foreseeable Proposed Projects and Changes

Since the impacts of emissions from the construction phase will have a localized impact, this analysis includes proposed projects or current facilities that are or would be in close proximity to the solar facility site and are or would be emitting regulated air pollutants during the construction of the Proposed Project. These existing and proposed projects include the Reid Gardner Power Plant, UNEV Pipeline, SWIP, Moapa Solar, LLC, TransWest 600kV and Bright Source solar project. The construction of the UNEV pipeline will be completed prior to the Proposed Project and construction schedules of the other proposed projects are only assumed and may not occur during the construction phase of the Proposed Project. Subsequently, the cumulative impacts of the Proposed Projects and other new projects in the general area are anticipated to be minimal.

#### 4.16.4.3. Cumulative Impact Analysis

The potential for air quality impacts from the Proposed Project to combine with impacts from other existing or proposed projects within the area of the cumulative analysis is discussed below.

In 2007, the Environmental Integrity report on the 50 dirtiest plants has Reid Gardner at the number one spot for dirtiest carbon dioxide emitting plant (Environmental Integrity Project 2007). Reid Gardner received 54 violation notices in July 2005, mostly for failure to control emissions as well as poorly monitored and recorded information for regulators. Nevada Power was required by the terms of a Consent Decree entered into with the State of Nevada and the EPA to upgrade its emissions technology with a new filter system as well as nitrogen oxide reducers. Consequently the units at Reid Gardner underwent improvements and have special burners and an over-fire air system to reduce oxides of nitrogen emissions. All four units utilize a wet-scrubber system to capture oxides of sulfur, and the oldest three units have been recently retrofitted with bag houses that will remove more than 99.9% of any particulate in the coal-burning process (NV Energy 2010). In 2009 Reid Gardner began burning a mixture of biomass with coal. According to Nevada Power Company's 2010-2029 Integrated Resource Plan, Reid Gardner units 1, 2, and 3 will be retired in 2020 (Nevada Public Utilities Commission, 2010).

The Proposed Project will have negligible long-term emissions and therefore long-term cumulative effects are not analyzed. Climate was also not analyzed because climate change, by nature, is cumulative and was discussed previously in Section 4.2, Climate.

The construction phase of the proposed project will last approximately five years and would generate emissions of CO, $NO_X$, VOCs, $SO_2$, $PM_{10}$ and $PM_{2.5}$. Ozone ($O_3$) is not directly emitted from emission sources but is formed in the atmosphere through a chemical reaction between NOx and VOCs in the presence of sunlight; NOx and VOC are referred to as $O_3$ precursors.

Emissions associated with the construction phase of the Proposed Project are based on the assumption that all necessary construction equipment would be operating on the same day and that all construction activities would occur simultaneously. This assumption provides a conservative estimate of proposed projects' maximum emissions during the construction phase. Current ambient air concentrations include emissions from existing facilities that are located near the Proposed Project.

Construction of reasonably-foreseeable, proposed projects within the same airshed as the Proposed Project would generate similar types of emissions and could also contribute to short term impacts on air quality. Individually, foreseeable projects could exceed the daily construction emission thresholds for regulated air pollutants emitted from the Proposed Project. However, actual quantities of emissions on a daily basis are not defined for the foreseeable, proposed projects. Since actual emissions will traditionally be less than the maximum, defined rates, cumulative impacts will be negligible. Also, as corridor projects, these projects will result in air emissions at or near the Proposed Project for a short period of time.

Construction emissions from foreseeable, proposed projects included in the cumulative impact area have not yet been quantified. It is assumed that the UNEV Pipeline, solar projects, and electric transmission proposed projects would also result in daily emissions of CO and $PM_{10}$; however, the HA 218 in which the projects would be located is an attainment area for both CO and $PM_{10}$. The proposed projects would also generate VOC and NOx in an area that is considered non-attainment for ozone and, thus, could potentially result in a cumulative impact to air quality. The Proposed Project will result in daily emissions of CO, $PM_{10}$, NOx and VOC. If the Proposed Project were constructed during the same time period as either of the other proposed projects in the area, construction would potentially result in short-term, localized, and unavoidable impacts to air quality. However, no cumulative impacts are anticipated to occur at levels above existing air quality standards or at levels that would prevent the area from achieving attainment status.

Due to current upgrades at the Reid Gardner Power Plant and eventual decommission of units 1, 2 and 3, cumulative short term effects during the Proposed Project construction period are assumed to be minimal and long term effects negligible.

### Alternatives

Impacts on air quality and GHGs from Alternative I would be similar to those of the Proposed Project since changes to construction would be relatively minor.

### 4.16.5. Noise

Other proposed projects within the vicinity include the UNEV Pipeline, Moapa Solar, LLC project, and the SWIP, TransWest 600kV and Bright Source solar project. These proposed projects, for the exception of Bright Source, will run adjacent to or near the existing BLM utility corridor. Mechanical equipment associated with each of the cumulative proposed projects is unlikely to result in combined noise impacts to a given known sensitive receptor due to the distance between each proposed project and the distance to the nearest sensitive receptor. However, due to the increase in traffic volumes along highways and local roads from the construction and operation of multiple projects, there may be an increase in the community's ambient noise levels.

Due to the remote nature of the proposed projects, their linear natures, and the size of each individual project's footprint, instances where cumulative noise impacts would occur at any given sensitive receptor location during construction activities are considered to be infrequent and would only occur if multiple proposed projects are constructed at the same time or when the construction activities occur along the adjacent proposed project boundaries where known sensitive receptors are located.

### 4.16.6. Biological Resources

The Proposed Project would be constructed in an area that supports a broad variety of biological resources.  Other projects that would affect Mojave Desert scrub/shrub vegetation as well as sensitive wildlife species within this region and habitat within the cumulative area of effect include UNEV Pipeline, Moapa Solar, LLC project, and the SWIP, TransWest 600kV, Bright Source solar and collectively the linear transmission, road and pipeline proposed projects.

#### 4.16.6.1. Existing Cumulative Conditions

Flora and fauna found at the Proposed Project as well as the cumulative effect area are described in Section 3.8.  The general ecological setting of the Proposed Project is consistent with Mojave Desert scrub. The area is dominated by open stands of creosote bush and white bursage. Desert saltbush scrub habitat and cactus-yucca scrub are also present.   The Mojave Desert is principle habitat for heat-tolerant organisms with specialized adaptations for thriving in a seeming inhospitable environment.  Species observed inhabiting the project area during surveys include the desert tortoise, several species of birds, hares, and a variety of lizards.

### 4.16.6.2. Reasonably Foreseeable Proposed Projects and Changes

The nature of the cumulative conditions can be separated into permanent and long-term effects and temporary and short-term effects. Proposed solar projects would result in relatively permanent loss of approximately 6,576 acres of vegetation, foraging ground, and habitat for desert tortoise as a result of tortoise fencing and exclusion from the facility (This does not include the 20,000 acres for the CoGentrix projects). The linear pipeline and electric transmission projects would have a short-term effect on vegetation during the construction phase but would be allowed to re-vegetate or be restored and species such as desert tortoise would be able to reutilize the area for habitat and burrows. Use of the existing utility corridor for access and transmission isolates the impact to a previously-impacted area, aids in reduction of impacts to historically un-impacted areas within the Reservation and allows for preservation of land further from I-15. Other than the anticipated projects described in Table 4-11, no other commercial or industrial projects are slated for the remaining 60,000-plus acres within the Reservation.

### 4.16.6.3. Cumulative Impact Analysis

Cumulative impacts to biological resources can be additive, that is, directly proportional in severity to the quantity of the resource affected (such as vegetation loss), or exponential. For exponential impacts, increasing levels become proportionately more substantial if they affect biological features that are critical to the survival of a species. An example of an exponential impact is habitat fragmentation, where the result of the construction of multiple projects in a particular area results in fragmentation of areas that formerly provided contiguous habitat into separate areas too small to support dependent species. Use of the existing utility corridor with multiple pipelines and electric transmission line for this project and foreseeable projects helps to eliminate fragmentation of viable desert habitat. The increasing width of the corridor does have a short-term, adverse effect on vegetation; however, it will recover with proper management. The utility corridor is approximately 4,000-foot wide and will be maximized at that point. The Proposed Project is on a mesa and by definition is somewhat isolated from the surrounding desert floor. The Moapa Solar, LLC project is located in the southwest corner of the Reservation in an area of lesser quality habitat and, therefore, does not add significantly to the cumulative impact. Overall loss of 32,620 acres for the current and reasonably foreseeable projects would have a cumulative impact for loss of foraging habitat or potential loss of existing sensitive plant species. This acreage includes 20,000 acres for solar projects that are unlikely to be built within the BLM solar zone southwest of the Reservation making realistic cumulative impacts of 12,620 acres.

Additionally, cumulative impacts on biological resources could be exacerbated as a result of project schedules. Construction of multiple projects within the same time period can result in greater impacts from emissions, noise, construction equipment, and vehicle traffic, and overall habitat degradation and loss. If projects were to be constructed consecutively, project impacts would be reduced in intensity but prolonged in duration, resulting in adverse impacts on the life cycles of species and/or resulting in prolonged or permanent displacement of wildlife from critical habitats. Given the number of projects planned within or near the utility corridor, it is likely that concurrent construction would occur. Large-acreage solar projects may also overlap in construction and have a cumulative impact upon air, noise, traffic and water resources.

### Native Vegetation

Permanent impacts to yucca and cacti species would occur as a result of cumulative effects of multiple projects. The assumption is made that the same impacts will hold true for the Moapa Solar, LLC project, on Reservation land. The BLM also manages sensitive species as part of their review of the ROW agreement for transmission, pipelines, and utility roads within the existing utility corridor as well as large scale projects on BLM lands. Mitigation measures will assure that only minimal cumulative impacts to native vegetation will occur as a result of the current and foreseeable projects. It is assumed that similar mitigation measures will be put in place for future projects and will reduce impacts to below significance levels. No threatened or endangered plant species were found within the Proposed Project or along proposed road or transmission lines. As a result of these studies it is highly unlikely that there would be a cumulative impact to threatened or endangered plant species.

### Wildlife and Special Status Species

As discussed in Section 4.8.4, the Proposed Project would result in impacts on special status species that could result in cumulative impacts in conjunction with similar impacts from future projects. Impacts would include noise and increased human/vehicle presence during construction, operations, and maintenance, all of which could disrupt normal behavior patterns and may cause direct injury and/or mortality. Species potentially affected would include special status wildlife species (reptiles and birds) with potential for significant impacts to the desert tortoise. Indirect cumulative significant impacts could result to the Moapa dace due to increased groundwater pumping in the California Wash Basin.

Construction activities would result in the disturbance, injury, or take of wildlife, including special status species. Additionally, as described above, construction and operation of the Proposed Project would result in vegetation loss and degradation of habitat, which would indirectly affect local wildlife populations through loss of habitat or foraging ground. Further, the presence of infrastructure associated with the Proposed Project may also indirectly cause mortality to wildlife by increasing the risk of predation on certain species by native predators such as ravens and raptor species or increase bird strikes with additional electric transmission lines.

Mitigation measures discussed in Section 4.8.4.1 would reduce cumulative effects from the Proposed Project. It is assumed that the foreseeable projects will also have similar plans in place to alleviate impacts to special status species and associated habitat and therefore reduce cumulative impacts to below significance.

**Desert Tortoise**

The desert tortoise is found from sea level to 5,000 feet of elevation. This essentially incorporates the entirety of the Reservation (72,723 acres). Desert tortoises were identified within the Proposed Project as well as observed along the proposed access road and transmission line corridor. Recent studies from the Moapa Solar, LLC project reported only one observation with the 1,000-acre project footprint.

Desert tortoise impacts from the foreseeable utility corridor projects would be minimal and temporary as desert tortoises could be moved from within the working ROW and monitored for incidental take purposes. Removing tortoises from harm's way and following USFWS guidance should reduce impacts to tortoises within the utility corridor. Further, all tortoises from within the solar facility boundary would be relocated to a suitable location within the Reservation and monitored for survival. By following the appropriate relocation /translocation management plans, tortoise monitoring plans, and USFWS guidance, cumulative impacts would be minimal and only impact less than 5 percent of suitable habitat within the Reservation and even a smaller percentage within the Northeast Mojave Desert Recovery Unit. The relocation area(s) would be preserved for the life of the Proposed Project and in accordance with the Biological Opinion.

All foreseeable projects within the cumulative effects watersheds boundary would be required, under Section 7 of the Endangered Species Act, to implement similar controls and Plans to alleviate impacts to desert tortoise below a significance threshold. The implementation of mitigation measures throughout the cumulative effects area and even larger northeastern recovery unit would have a less than significant impact upon desert tortoise populations.

It is concluded that there would be direct impacts to desert tortoise and habitat as a result of the cumulative projects; however, they would not have a significant, adverse effect upon desert tortoise in the area of cumulative effect.

A similar study has been completed by the USFWS discussing the effects to desert tortoise from large scale construction projects, specifically renewable energy projects, with its range of the Mojave Desert. The following information has been extracted from the Biological Opinion for the Proposed Project:

> Renewable energy projects, particularly solar energy projects, have emerged as an important new threat to the desert tortoise. In an effort to properly manage the resources on public land in the southwest at a landscape level while allowing some development of

solar energy projects, the BLM is preparing a Programmatic EIS. On October 27, 2011, the Supplement to the Draft Solar Programmatic EIS became available to the public for a 90-day comment period (BLM and Department of Energy 2010). The BLM's preferred alternative includes 17 solar energy zones, totaling about 285,000 acres potentially available for development within the zones. The preferred alternative also establishes a variance process that will allow development of well-sited projects outside of solar energy zones on an additional 20 million acres of public land. To date, 13 commercial-scale solar energy facilities have been approved or constructed (Table 4-13). Approved projects include those which have completed all actions requires by agency regulations. Additional information on the Draft Solar Programmatic EIS can be found on the internet at: *http://solareis.anl.gov/index.cfm.* For a list of all solar projects refer to website: *http://www.seia.org/galleries/pdf/Major%20Solar%20Projects.pdf.*

As discussed above, the project-by-project and cumulative effects of the renewable energy program within the range of the Mojave population of the desert tortoise have the potential to reduce the amount of available, occupied and/or suitable habitat by hundreds of thousands of acres. The effects from utility-scale projects and impacts to habitat and population (i.e., genetic) connectivity have recently come to the forefront as a significant threat to the desert tortoise.

Table 4-13.

**Approved Solar Projects in Desert Tortoise Habitat on Public and Private Land**

| Project | Acres of Desert Tortoise Habitat | Recovery Unit |
|---|---|---|
| Ivanpah Solar Electric Generating System- CA | 3,582 | Eastern Mojave |
| Abengoa Mojave | 1,765 | Western Mojave |
| Nevada Solar One- NV | 400 | Northeastern Mojave |
| Copper Mountain North, NV | 1,400 | Northeastern Mojave |
| Copper Mountain - NV | 380 | Northeastern Mojave |
| Silver State North- NV | 2,966 | Eastern Mojave |
| Genesis- CA | 4,640 | Colorado |
| Blythe- CA | 7,025 | Colorado |
| Blythe Energy II- CA | 9,400 | Colorado |
| Palen- CA | 4,195 | Colorado |
| Desert Sunlight- CA | 4,165 | Colorado |
| Amargosa Farm Road - NV | 4,350 | Eastern Mojave |
| Calico | 4,604 | Western Mojave |

The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994 (59 Federal Register 5820). Critical habitat is designated by the Service to identify the key biological and physical needs of the species and key areas for recovery and to focus conservation actions on those areas. Critical habitat is composed of specific geographic areas that contain the biological and physical features essential to the species' conservation and that may require special management considerations or protection. These features, which include space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats, are called the Primary Constituent Elements (PCEs) of critical habitat. The specific PCEs of desert tortoise critical habitat are: sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

Critical habitat of the desert tortoise would not be able to fulfill its conservation role without each of the PCEs being functional. As examples, having a sufficient amount of forage species is not sufficient if human-caused mortality is excessive; an area with sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow would not support desert tortoises without adequate forage species.

The final rule for designation of critical habitat did not explicitly ascribe specific conservation roles or functions to the various critical habitat units. Rather, it refers to the strategy of establishing recovery units and desert wildlife management areas recommended by the recovery plan for the desert tortoise, which had been published as a draft at the time of the designation of critical habitat, to capture the "biotic and abiotic variability found in desert tortoise habitat"
(59 Federal Register 5823). Specifically, we designated the critical habitat units to follow the direction provided by the 1993 draft recovery plan (Service 1993) for the establishment of desert wildlife management areas. The critical habitat units in aggregate are intended to protect the variability that occurs across the large range of the desert tortoise; the loss of any specific unit would compromise the ability of critical habitat as a whole to serve its intended function and conservation role.

Despite the fact that desert tortoises are not required to move between critical habitat units to complete their life histories, both the original and revised recovery plans highlight the importance of these critical habitat units and connectivity between them for the recovery of the species. Specifically, the revised recovery plan states that "aggressive management as generally recommended in the 1994 Recovery Plan needs to be applied within existing (desert) tortoise conservation areas (defined as critical habitat, among other areas being managed for the conservation of desert tortoises) or other important areas … to ensure that populations remain distributed throughout the species' range …. (Desert tortoise) conservation areas capture the diversity of the Mojave population of the desert tortoise within each recovery unit, conserving the genetic breadth of the species, providing a margin of safety for the species to withstand catastrophic events, and providing potential opportunities for continued evolution and adaptive change …. Especially given uncertainties related to the effects of climate change on desert tortoise populations and distribution, we consider (desert) tortoise conservation areas to be the minimum baseline within which to focus our recovery efforts (pages 34 and 35, Service 2011e)."

The Service determined that the levels of anticipated take associated with the Proposed Project alone are not likely to jeopardize the continued existence or adversely affect the recovery of the desert tortoise. No designated critical habitat would be affected by the Proposed Project.

### Golden Eagle

An estimated 3,000 acres considered suitable foraging habitat for Golden Eagles would be affected by projects within the area of cumulative effect. Loss of foraging habitat could impact foraging behaviors of the Golden Eagle, which could cause adverse impacts to the fitness of Golden Eagle populations within the known nesting grounds of Arrowhead Canyon. Known nesting areas are located 5 to 8 miles from the closest proposed project. It is not suspected that noise and other construction activity would affect nesting behavior at this distance. The potential for in-air collision with new electric transmission lines is also a concern for the cumulative effect scenario. Given that the utility corridor is currently populated with seven electric transmission lines ranging in size from 115kV to 500kV it is assumed that the addition of two proposed lines on the east side would not have a cumulative effect on in-air collision. The existing lines have been in place for many years and Golden Eagle foraging flight patterns have most likely adapted to the vast size of the utility infrastructure. To mitigate any direct effects or potential cumulative effects, the Proposed Project will develop and implement an Avian and Bat Protection Plan. The BLM also requires this Plan for any project on BLM-managed land. With mitigation measures in place it is highly unlikely that the cumulative effects scenario will have an impact upon the Golden Eagle.

### 4.16.6.4. Alternatives

Alternative I would have a similar impact on biological resources given that the location, construction activities, and operational conditions would be similar to the Proposed Project. The contribution to cumulative impacts of biological resources would be the same or potentially less under Alternative I as those expected under the Proposed Project.

## 4.16.7. Cultural Resources

The Applicant conducted a Class I overview of the Proposed Project and adjacent areas for 1-mile in all directions and in December of 2010 and June 2011 conducted a Class III intensive pedestrian survey of all portions of the APE of the Proposed Project that had not been previously surveyed to current standards. No previously undocumented historic properties were found in the APE of the Proposed Project.

There would be no cumulative impacts to cultural resources as a result of the Proposed Project because there would be no impacts. As described in Section 4.9, and outlined in Chapter 3, historic, cultural and religious properties, and archaeological resources are documented in the study area containing the Proposed Project. However, archaeological artifact scatters and features that have been reported for the Proposed Project have been recommended not eligible for the NRHP and do not qualify as historic properties.

The APE of indirect impacts would include the viewsheds of contributing structures and segments associated with these linear historic properties. Impact assessment would need to address whether the segments retain essential historic integrity and contribute to the significance of the larger linear property, what elements of the natural and physical environment contribute to the integrity of historic setting and feeling for contributing segments of these linear resources, and how the Proposed Project may alter those elements of the natural and physical environment.

### 4.16.7.1. Existing Cumulative Conditions

Cumulative conditions are known for the Proposed Project as well as for Alternative I area due to historical studies completed on the Proposed Ash Grove Cement Plant Project in 2006. Other known conditions in the area are associated with the historic railroad and the Old Spanish National Historic Trail on the east side of I-15.

Past and present developments in the vicinity of the Proposed Project include: transportation corridors around the Proposed Project including I-15 and the Union Pacific Railroad to the south and east, U.S. Highway 93 to the west, and State Highway 168 to the north; three designated utility corridors including the corridor associated with the Proposed Project and crossing through Crystal substation, a corridor to the west roughly following U.S. Highway 93, and a corridor southeast of California Wash; and two existing power plants in the Dry Lake Valley area. The area is thinly populated and existing commercial development is largely restricted to a truck stop at the I-15-U.S. Highway 93 interchange and the tribal Travel Plaza at the State Highway 40 interchange.

### 4.16.7.2. Reasonably Foreseeable Proposed Projects and Changes

Past, present, and reasonably-foreseeable developments in the general area of the Proposed Project have involved the development of three utility corridors that include natural gas, petroleum product and electric transmission lines, and associated infrastructures such as electric substations. These developments have disturbed prehistoric and historic archaeological sites and have affected the historic setting of cultural landscapes and linear historic properties such as the Old Spanish National Historic Trail and the historic San Pedro, Salt Lake and Los Angeles Railroad. The majority of significant archaeological sites in the general area have been prehistoric rock shelters in the nearby hills, prehistoric camps associated with dune deposits in the Dry Lake Valley area, and historic sites associated with the railroad. There are railroad-related properties near the Proposed Project, but they will not be affected by the Proposed Project.

#### 4.16.7.3. Cumulative Impact Analysis

Direct impacts to cultural resources are irreversible. Because all impacts to cultural resources would be avoided, the Proposed Project would not contribute to cumulative impacts to cultural resources. No historic properties have been identified in the APE of the Proposed Project and the Proposed Project will not contribute to cumulative direct impacts to historic properties. In addition, the lease area is shielded by terrain from visual impact to the historic setting of historic transportation corridors in the area.

#### 4.16.7.4. Alternatives

**Alternative I**

The potential impacts of Alternative I within the BLM-designated utility corridor and within the solar facility boundary would be the same given that the location, construction activities, and operational conditions would be similar to the Proposed Project. The contribution to cumulative impacts of cultural resources would be the same or potentially less under Alternative I as those expected under the Proposed Project.

### 4.16.8. Socioeconomics

#### 4.16.8.1. Geographic Extent

The socioeconomic potential impacts of the Proposed Project would be limited to the local and regional area (county) surrounding and including the Reservation and a skilled labor set from Las Vegas. Therefore, the socioeconomic cumulative effect area is defined by an area similar to that outlined in Section 4.10. Section 4.10.3 concluded that the Proposed Project would have short-term and long-term beneficial impacts during construction, O&M, and decommissioning activities.

#### 4.16.8.2. Existing Cumulative Conditions

Section 3.9 describes socioeconomic conditions by census block (local) as well as at a Clark County level for population and employment, demographics, housing supply, and social and public services.

Clark County has been affected by the recent recession with unemployment increasing and housing development and population growth decreasing. Employment and population growth have been trending downwards within the region since 2008. Clark County median and per capita incomes exceed the U.S. average, although 10.5 percent of individuals within the county have incomes that are below the poverty-level threshold. Total personal income shows that the county accounts for 70 percent of the total wealth of the state.

Existing conditions have been influenced by the construction and operation of past and present projects, which have affected demand for and supply of jobs as well as housing demand, business revenues, and property values. Local demand for housing and workforce has historically reflected the prevailing level of development and growth in the area.

### 4.16.8.3. Reasonably Foreseeable Proposed Projects and Changes

For the purpose of this analysis, all current and foreseeable projects listed in 4.16.1 are included since they would contribute short-term and potentially long-term beneficial cumulative impacts to employment, housing, and local/regional tax base and sales.

### 4.16.8.4. Cumulative Impact Analysis

The Proposed Project, when added to past, current or foreseeable renewable energy projects, would contribute positive cumulative effects to local and regional business owners, housing market, hotel and motel revenues, as well as increase the local tax base.

The type of proposed projects (renewable energy and corridor construction projects) would have a specific short-term socioeconomic impact as large numbers of employees would be needed during construction and a much smaller number for O&M of the facilities.

Employees would come from the current unemployment pool, tribal members and from other regions of the country with renewable energy, pipeline, and electric transmission expertise. Local employment would encourage local spending while regional employment would boost hotel occupancy and local tourism through the gaming industry. The projects would also use local resources, materials, and commodities from local suppliers having a far reaching, but short-term effect. The Tribe would benefit from use of their Travel Plaza for fuel, food and other supplies. The local community would benefit from clean energy projects and reduce the need for fossil fuel power plants and use of generators at the Travel Plaza for energy.

Concurrent construction of the foreseeable projects would result in a beneficial, cumulative impact on the local and regional economy and tourism, and could decrease unemployment during the periods of construction.

### Environmental Justice

Cumulative impacts to environmental justice are not analyzed for the Proposed Project because the Proposed Project is supported by the Reservation and would not result in disproportionately high or adverse effects on minority or low-income populations and, therefore, would not contribute to cumulative impacts to environmental justice. The environmental justice effects of Alternative I are similar to the Proposed Project.

### 4.16.8.5. Alternatives

Alternative I would have a similar impact on socioeconomic conditions that given the location, construction activities, and operational conditions would be similar to the

Proposed Project. The contribution to cumulative impacts to socioeconomics would be the same under Alternative I as those expected under the Proposed Project.

## 4.16.9. Resource Use Patterns

Cumulative impacts to Resource Use Patterns are not analyzed for the Proposed Project because the Proposed Project would result in no impact to resource use and, therefore, would not contribute to cumulative impacts to resource use. The land on which the Proposed Project and Alternative I would be sited was partitioned by the Tribe for commercial or economic stimulus development projects. No current or foreseeable projects on Reservation land are related to mining or other utility projects constructed outside of the BLM utility corridor, other than what is outlined in this cumulative effects section, and, therefore, will not result in cumulative effects.

## 4.16.10. Transportation/Motorized Vehicle Access

### 4.16.10.1. Geographic Extent

Traffic impacts of the Proposed Project would be limited to regional freeways and local roads that comprise the local transportation network; therefore, the geographic area analyzed for cumulative traffic and transportation impacts is the road network within Clark County. The Proposed Project would potentially impact traffic and transportation systems by increasing the volume of traffic during the construction phase of the Proposed Project. Because impacts to traffic and transportation would result primarily from construction-related activities, this analysis is limited to cumulative projects that would have concurrent construction schedules.

### 4.16.10.2. Existing Cumulative Conditions

The Proposed Project would be located in Clark County, Nevada, in a largely undeveloped area. Roads that are accessible to the Proposed Project are listed in Table 3.19 (see Section 3.11.6 Transportation Networks), and the LOS for roads and intersections that would be used during Proposed Project construction are listed in Table 3.20 and Table 3.21 (see Section 3.11.6, Transportation Networks).

### 4.16.10.3. Reasonably Foreseeable Projects and Changes

Foreseeable development throughout the cumulative effects area that could affect traffic and transportation is dominated by proposed projects listed below:

- UNEV Petroleum Pipeline Project
- Moapa Solar, LLC Project
- Southwest Intertie and TransWest 600kV

The construction of UNEV Petroleum Pipeline Project does not overlap with the construction schedule of the Proposed Project. Therefore, these projects would not have any cumulative effect on the traffic due to the Proposed Project. Moapa Solar, LLC Solar Project, SWIP and TransWest 600kV are the only proposed projects in the vicinity of I-15 that may be potentially constructed concurrently with the Proposed Project.

### 4.16.10.4. Cumulative Impacts Analysis

This section discusses the combined effects on traffic load, capacity, and LOS standards of the Proposed Project and reasonably foreseeable projects.

### Traffic Load, Capacity, and Level of Service.

Most local roads in the cumulative effects area are infrequently used and would not be adversely affected by a temporary increase in road traffic. Based on the high number of vehicle trips per day and the fact that heavy equipment would be transported on these roads, mitigation is required to minimize impacts to these local roads. This mitigation would require that any damage to streets be repaired following Project construction.

**Interstate 15**. Construction of the Proposed Project would increase use of I-15 by an average of 876 vehicle trips. The Moapa Solar, LLC Project would add approximately 276 vehicle trips to I-15. The Proposed Project and the Moapa Solar, LLC Project would be located near the I-15 corridor. Even though it is likely that during certain periods construction of these projects would have overlapping schedules, these additional vehicle trips would not degrade traffic flow on I-15 and associated on/off-ramps. The two transmission line projects would only have temporary and minimal impacts to traffic volume on I-15 due to the linear nature of the projects and need to work and travel within their proposed rights of way.

**Local Arterial Roadways.** After exiting I-15, vehicles would access the Proposed Project, the Moapa Solar, LLC Project site, and SWIP using local arterial roadways, US-93 and North Las Vegas Boulevard. The LOS (ranging from A to B - see Table 3.21 in Section 3.11.6.2, [Major Traffic Routes within or adjacent to the Proposed Project]) of local roads is currently acceptable, and the addition of an average of approximately 1,052 vehicle trips (876 vehicle trips from Proposed Project, 276 vehicle trips from the Moapa Solar, LLC Project, and an unknown amount from SWIP) would also not likely result in a substantial effect on LOS for the segment of US-93 between I-15 and North Las Vegas Boulevard and on North Las Vegas Boulevard. The Proposed Project, Moapa Solar, LLC Project, and SWIP would not adversely affect traffic flow on local roadways during peak construction.

**Intersections.** With concurrent construction, the three, two-way, stop-controlled intersections on US-93 - US-93 at I-15 Northbound Ramps, US-93 at I-15 Southbound Ramps, and US-93 at North Las Vegas Boulevard - will experience an addition of an average of 1,052 vehicle trips (876 vehicle trips from Proposed Project and 276 vehicle trips from the Moapa Solar, LLC Project). Even with these additional vehicle trips, the approaches at the above-mentioned intersections would still operate at acceptable LOS (LOS D or better) except for the southbound approach of the intersection of US-93 at North Las Vegas Boulevard. The southbound approach of the intersection of US-93 at North Las Vegas Boulevard operates at failing LOS (LOS F) in the PM peak hour. The intensity of this would be lessened with the implementation of a traffic mitigation plan.

### Alternatives

Alternative I would be located on the mesa and have a reduced footprint, but would require the same road usage during construction; therefore, cumulative impacts associated with Alternative I would be the same as the Proposed Project.

## 4.16.11. Special Management Areas

Cumulative impacts to Special Management Areas were not analyzed for the Proposed Project because it will not impact any SMAs, National Preserves, Parks, or Wilderness Areas. The current and foreseeable projects evaluated in the cumulative scenario will not impact SMAs. Likewise, Alternative I will not impact SMAs; therefore, it was not analyzed for cumulative effects.

## 4.16.12. Visual Resource

### 4.16.12.1. Geographic Extent

The geographic scope for the analysis of the Proposed Project's contribution to cumulative impacts to visual resources includes all projects within the same viewshed as the Proposed Project. The BLM handbook for analyzing visual resource impacts states that an area more than 15 miles away is seldom seen. Under this guidance, the geographic extent is described as within the adjacent east/west mountain ranges and within 15 miles north and south along I-15.

Cumulative impacts to visual resources could occur if multiple projects are being constructed at the same time or the viewshed is impaired or significantly changes the natural surroundings as a result of project construction and operation. It is anticipated that one or more of the proposed projects could be under construction at the same time. The Moapa Solar, LLC and the Proposed Project would both be constructed on the Reservation and with 10 miles of each other.

### 4.16.12.2. Existing Cumulative Conditions

As described in Section 3.13, the terrain of the area is relatively flat with the Arrow Canyon Range Mountains in the background. Vegetation is primarily desert scrub/shrub and the area surrounding the Proposed Project within a 15-mile radius in all directions can be described as industrialized open desert land. Many electric transmission lines transect the area as well as several power plants, an electric substation, and nearby quarries and cement plant operations. I-15 and the UP railroad also traverse the cumulative visual area.

### 4.16.12.3. Reasonably Foreseeable Proposed Projects and Changes

Planned development for the area that would have cumulative effects on visual resources would be confined to aboveground apparatus such as renewable solar projects and electric transmission lines. Other projects such as pipelines would have a short-term cumulative effect if construction took place at the same time as other foreseeable projects, but over the long term would not add to cumulative effects.

### 4.16.12.4. Cumulative Impact Analysis

The potential of all proposed projects to produce aesthetic and visual impacts within the geographic extent of the cumulative analysis is described below. Using the same methodology described in Section 3.13.1, the Proposed Project was grouped with other foreseeable projects to determine overall cumulative impacts as summarized in Table 4-14 below. Renewable energy projects (solar) within the Reservation and the foreseeable transmission line projects within the BLM utility corridor would have weak-to-moderate cumulative effects on viewshed. Given the abundance of transmission lines currently within the utility corridor, future lines would simply blend together from most viewpoints and seemingly look like a single industrial corridor as is the general idea for grouping linear projects. The proposed Moapa Solar, LLC project would be located approximately 10 miles west of the Proposed Project and would not be seen within the same viewshed as the Proposed Project from any vantage point. Viewsheds from Quality Rating Units 1-5 would be most affected by the proposed TransWest transmission line that would essentially parallel I-15 on the east side. This proposed 600kV line would be seen from all viewpoints; however, they would not be seen in the same viewshed as the other projects and therefore would not have a cumulative effect.

Table 4-14.
**Visual Resources Cumulative Effect**

| Quality Rating Unit | Degree of Contrast from Current Viewshed | Current Visual Resource Inventory Class |
|---|---|---|
| Site 1 | Weak | IV |
| Site 3 | Moderate | IV |
| Site 4 | Moderate | IV |
| Site 5 | Moderate | IV |

Construction impacts to visual resources from the cumulative projects would be similar to the Proposed Project discussed in Section 4.14. Large machinery, transportation vehicles, and fugitive dust could impair the viewshed if projects were constructed at the same time. Actual impacts from the Proposed Project would be minimized given its location upon the mesa and inability to see the site from most viewpoints. If not constructed concurrently with the other foreseeable projects, cumulative impacts to visual resources would be minimal and temporary.

## 4.16.13. Public Health and Safety

### 4.16.13.1. Geographic Extent

Impacts to hazards and hazardous materials caused by the Proposed Project would be limited to the Proposed Project site and land directly adjacent to the site because impacts would result only from incidents associated with hazardous materials during construction or maintenance activities. Origination of hazardous materials with respect to transport is unknown and could change during construction and operations; therefore, cumulative effects to public health and safety as a result of indirect hazardous spills are not evaluated here.

Cumulative impacts could occur during construction and operation and would be limited to the areas of concurrent construction or maintenance. The geographic extent of the cumulative effects analysis with respect to fire hazards is limited to the cumulative effects area shown in Figure 4-3 because all construction and operation activities associated with the Proposed Project would take place within the Reservation and areas immediately adjacent and bound by the major mountain ranges. Cumulative impacts with respect to fire hazards could occur during construction and operation and would be limited to the areas of concurrent construction or maintenance.

### 4.16.13.2. Existing Cumulative Conditions

Within the cumulative effects area, there are no residential developments and only commercial and industrial infrastructure. Underground storage tanks (USTs) are present at the Travel Plaza. The remainder of the area is primarily undeveloped open space / desert scrub-shrub. Within the undeveloped and open space land, there is little likelihood of significant soil or groundwater contamination, based on a lack of uses that would involve hazardous materials. There is no documentation dating back to pre-ownership by the Tribe that any industrial or commercial activity took place on the mesa or within the cumulative effects area within the Reservation boundary.

The Reservation and area around the Reservation is classified by Clark County as a moderate fire zone. This designation is primarily due to the lack of fire-fighting resources in the area.

### 4.16.13.3. Reasonably Foreseeable Proposed Projects and Changes

For the purpose of this analysis, all current and foreseeable projects listed in 4.16.1 are included since they consist of large construction projects that would require the use of fuels and hazardous materials. These projects would also use equipment that could act as an ignition source.

### 4.16.13.4. Cumulative Impact Analysis

The Proposed Project would only have hazardous cumulative effects if significant spills occurred at the same time and in the same locality as the current or foreseeable projects. Given the site-specific and linear nature of the foreseeable proposed projects, it is highly unlikely that the Proposed Project would contribute to cumulative effects to public health and safety. Contractors would instigate and follow regulatory procedures outlined in SPCC, SWPPP, and hazardous waste management plans to stop, contain, and clean up hazardous spills on-site. It is assumed that foreseeable projects on Reservation and BLM-managed lands would comply with similar plans and, therefore, not contribute to cumulative effects.

Fire hazards would be associated more so with the construction phase of the Proposed and foreseeable projects. A cumulative risk would only be asserted if multiple projects were under construction at the same time. As discussed previously, the likelihood of multiple project construction overlapping is moderate to high given the 3-5 year construction process for large-scale solar and utility projects. A Fire Management Plan would be developed for the Proposed Project as well as for other projects on Reservation and BLM lands, thereby reducing the cumulative effects for fire hazard. The Proposed Project would have a fire-suppression system and a 20-foot wide fire break around the perimeter and would not impose a cumulative effect within the outlined area.

#### Alternatives

Alternative I would be located on the mesa and have a reduced footprint; therefore, cumulative impacts associated with Alternative I would be the same as the Proposed Project.

## 4.17. Unavoidable Adverse Impacts

The following section describes the unavoidable adverse impacts that would occur as a result of the Proposed Project and may be affected by construction, O&M, and decommissioning activities. In addition, this section includes a disclosure of irreversible and irretrievable commitments of resources if the Proposed Project is approved. An irreversible and irretrievable commitment occurs when direct and indirect impacts from its use limit/stop future use options. Irreversible commitments apply to nonrenewable resources and irretrievable commitments apply to resources that are neither renewable nor recoverable.

### 4.17.1. Air Quality and Climate

Construction, operational, and decommissioning activities would result in unavoidable adverse impacts on air quality. However, these impacts are anticipated to be below thresholds that define any noticeable change to air quality or the local/regional climate. Exhaust and fugitive dust emissions generated from construction equipment and mobile sources would increase ambient concentration of regulated air pollutants. Wind-driven emissions of fugitive dust would be generated following disturbances by construction activities, including mobile sources traveling on paved and unpaved roadway surfaces. Soil-derived particles can obstruct visibility, cause property damage, and/or contribute to violations of air quality standards for fine particles if not properly managed. However, these emissions of engine exhaust and fugitive dust are not expected to contribute to local or regional exceedances of criteria air pollutant NAAQS for which the areas have been designated as non-attainment.

The estimated yearly construction and decommissioning emissions totals for $O_3$ precursors (NOx and VOCs) would be less than de minimis thresholds as specified under the Federal General Conformity Rule. GHG emissions associated with the Proposed Project would be considered a long-term effect. The Proposed Project's GHG emissions were compared to GHG emissions from existing inventories and proposed projects within Nevada and indications are that the Proposed Project would not affect the state's goals of reducing GHG emissions to 1990 levels by 2020.

Potential impacts of the Proposed Project would have negligible impacts on existing carbon storage capacity given the relationship between the size of the Proposed Project and the total regional extension of the air basin; however, it would still be an unavoidable adverse impact.

### 4.17.2. Soil

It is expected that the Proposed Project would cause elevated levels of dust emissions and loss of topsoil, especially during construction and O&M activities. Soil impacts could also occur from petroleum and other hazardous material spills. The applicant will develop SWPPP and SPCC plans that will discuss and implement mitigation measures, such as stockpiling of topsoil during ground-disturbing activities for later re-vegetation efforts and spill clean-up procedures. Irreversible and irretrievable impacts on soil resources in areas where vegetation fails and subsequent erosion occurs are anticipated. Therefore, affected soils would be irretrievably and irreversibly lost, which would be an unavoidable adverse impact.

### 4.17.3. Water Resources/Hydrology

As discussed in Section 4.5, changes in drainage patterns may increase erosion and sediment flow. However, due to the size and capacity of the ephemeral channels as well as BMPs that would be implemented, flooding at the site or downstream from the site is thought to be negligible. The Proposed Project may also decrease the recharge of the aquifer. The Proposed Project would require 72 AFY for the construction period and no more than 20 to 40 AFY for O&M activities. Water would be supplied from one of the existing Reservation wells, TH-1, which is capable of producing 60 gpm of water. It is currently estimated 1,400 acres (2.18 square miles) of the 2,000 acres will be graded for module and infrastructure placement. The California Wash Basin covers 318 square miles. Assuming all of the graded area would become semi-impervious, this would only account to about 0.70 percent of the entire California Wash Basin, given that most of the area is undeveloped. Therefore negative effects to groundwater recharge due to construction and operation of the Proposed Project would be unlikely.

Irreversible and irretrievable contamination of surface water bodies or the groundwater aquifer could occur as a result of this Proposed Project, however with implementation of BMPs described in the SPCC plan, it is unlikely that the Proposed Project would contaminate surface water bodies or groundwater aquifers.

Potential overdraft of groundwater resources from cumulative projects would be an irreversible and irretrievable effect.

### 4.17.4. Noise

As discussed in Section 4.7 there are no local sensitive human receptors, nor are there local noise ordinances within the Proposed Project area. In addition, there would not be unavoidable adverse impact or irretrievable or irreversible commitment of this resource. Construction activities would cause increased noise levels, but this would be a short-term and localized effect. It is expected that low-level noise from transformers and vehicle use related to O&M activities would add a long-term unavoidable impact to existing noise conditions.

### 4.17.5. Biological Resources

Loss of 2,000 acres of Mojave Desert scrub on the Proposed Project would result in an unavoidable adverse impact for the life of the Proposed Project. However, the 2,000 acres of foraging habitat that would be lost is minimal (0.04% assuming 10-mile radius foraging area for Golden Eagles) in comparison to available habitat within Dry Lake Valley. Because impacts would affect only a localized region, the loss of native vegetation would not cause an irreversible and irretrievable commitment of the resource on a regional basis.

Localized and long-term, unavoidable, adverse impacts on wildlife, including special status species, would occur. Impacts to cacti and yucca species and desert tortoise on-site would be considered irreversible and irretrievable commitment of the resource. In addition, construction of the Proposed Project would result in the relocation/translocation of all desert tortoises within the solar facility boundary. The Proposed Project would result in loss of desert tortoise habitat and create stress for both relocated/translocated individuals and existing tortoises within the relocation site. The Proposed Project could result in loss of health, increased risk of predation, increased intra-specific competition, and death.

Permanent fencing of 2,000 acres would greatly reduce access to any native habitat within the fenced areas that would be able to re-establish and/or survive mowing activities. Loss of access to habitat would cause wildlife to rely more heavily on habitat in the surrounding area due to the loss of foraging areas, shelter, and nesting opportunities. Additionally, the Proposed Project would remove suitable foraging habitat for Golden Eagles and Burrowing Owls. The closest suitable Golden Eagle nesting habitat is approximately 7-10 miles west of the Proposed Project. Due to the distance between the Proposed Project and suitable nesting habitat, the Proposed Project would not directly impact nesting Golden Eagles.

Burrowing Owls may be disturbed during the construction period by noise and human interaction, thereby potentially causing them to relocate outside of the Proposed Project. Golden Eagles and Burrowing Owls may lose approximately 2,000 acres of foraging area and have increased potential for injury as a result of direct collision with new electric transmission lines. Impacts to cacti and yucca species, desert tortoise, Golden Eagles and Burrowing Owls may be considered irreversible and irretrievable commitment of the resources.

### 4.17.6. Cultural Resources

Construction of the Proposed Project is not anticipated to affect any properties eligible to the NRHP. No new cultural resources eligible for listing were identified during the pedestrian survey of the site. In the event that ground disturbance causes the inadvertent discovery of previously unidentified subsurface cultural resources they will be managed based on guidance from the appropriate agency and the Tribe.

### 4.17.7. Social and Economic Conditions

During peak construction, the workforce could reach 400 workers and if all three phases are completed and the Proposed Project is commissioned, up to 35 permanent staff would be required to operate and maintain the facility and provide plant security. This workforce would have a beneficial economic impact on the local economy. The Proposed Project would increase local revenues, which would have a beneficial effect. The analysis indicates that no irreversible and irretrievable commitments of the economic resources would occur.

### 4.17.8. Environmental Justice

The Proposed Project site is considered an environmental justice community with respect to minority populations. Residents on the Reservation represent the closest environmental justice population to the Proposed Project. As Native Americans, residents on the Reservation meet the criteria of a minority population and, thus, are subject to environmental justice consideration under the Executive Order. As discussed above, it is anticipated that the Proposed Project will have a positive effect on the local population (including Native American populations), by creating both temporary and long-term jobs. No unavoidable adverse impacts or irreversible and irretrievable commitments of resources are expected.

### 4.17.9. Resource Use Patterns

The Proposed Project would limit future use of 2,000 acres of the Reservation for other uses for the life of the Proposed Project and would irreversibly and irretrievably commit the resource.

### 4.17.10. Energy and Minerals

There are no active mines or surface quarries within 5 miles of the Proposed Project. With the exception of a 0.5-mile transmission line ROW on BLM land, the Proposed Project takes place on Reservation land. The Tribe has no future plans for mining within the Proposed Project. Therefore, no unavoidable adverse impacts or irreversible and irreversible commitments of energy and mineral resources are expected.

### 4.17.11. Transportation/Motorized Vehicle Access

Construction of the Proposed Project would require activities and equipment movement near and within public roadway ROWs, resulting in short-term increases in the use of I-15 and local arterial roadways. Heavy equipment would be transported to the site and would likely remain for the duration of construction. Construction of the Proposed Project would result in a short-term increase in traffic volume of a maximum of 800 trips per day due to the construction labor force. Additionally, construction of the Proposed Project would result in short-term increases in traffic volume of a maximum of 76 trips per day due to delivery of construction equipment and supplies to the site. These, combined, would result in an increase of 876 vehicle trips per day during construction. During construction, oversized loads could cause short-term, temporary transportation disruptions and may require wider turning clearance. Impacts on the transportation network and impacts on traffic would occur only during construction, and occasionally during maintenance activities. The Proposed Project would not cause a change in the level of service for the affected roads and would not cause a permanent irreversible and irretrievable commitment of the resource.

### 4.17.12. Special Management Areas

The Proposed Project is located approximately 7 miles west of the Valley of Fire State Park, 7 miles southeast of the Moapa Valley National Wildlife Refuge, 10 miles north of the Muddy Mountains Wilderness Area and 10-13 miles east of the Arrow Canyon Wilderness Area. No SMAs or LWCs will be directly or indirectly affected by the Proposed Project, and no irretrievable and irreversible commitment of resources would occur.

### 4.17.13. Visual Resources

As described in Section 4.13, there were five scenic quality rating units evaluated based on public travel routes and the uniformity of the area. Existing views onto the Proposed Project are limited, available specifically from I-15 (south bound) and Route 40. Due to the flat topography of the Proposed Project and the surrounding topographical features such as the mesa and mountains, besides the existing transmission lines located within the existing utility corridor, the Proposed Project is not readily visible from many viewpoints within the surrounding area. Construction of the Proposed Project would cause unavoidable, short-term and long-term, adverse impacts on visual resources by disrupting the viewshed in the Proposed Project, but the Proposed Project would not result in an overall irreversible or irretrievable commitment of visual resources.

### 4.17.14. Public Health and Safety/Hazardous Materials

Hazardous materials that may be used or come into contact with during construction activities include gasoline, diesel fuel, oil, hydraulic fuels and lubricants, paints, solvents, adhesives, batteries, welding materials, and mineral oil for transformers. During construction activities, localized spills and leaks of hazardous materials from equipment, storage sites or vehicles/equipment could occur as a result of improper handling or inadvertent spills, which could result in exposure to human or local wildlife.

O&M of the Proposed Project would involve the periodic use and transport of hazardous materials, hydraulic fluid, welding gases, and herbicides. In addition, there would be one on-site, diesel-fueled, backup firewater pump that would be located near the O&M building.

Mitigation measures have been identified to reduce potential impacts below federal and state safety limits; however, the Proposed Project could cause an irreversible and irretrievable commitment of the resource or unavoidable adverse public health and safety impacts.

## 4.18. Relationship between Short-Term Uses and Long-Term Productivity of the Environment

NEPA requires consideration of the relationship between short-term (less than three years after construction ends) uses of the environment and long-term (longer than three years after construction ends) productivity associated with the Proposed Project.

Construction and O&M would result in the permanent loss of some resources and temporary loss of other resources over the life of the Project resulting in biological, soil, water, public safety, visual, noise, and air quality impacts. Approximately 2,000 acres of Mojave Desert scrub would be temporarily lost within the Proposed Project, and some flora and fauna specimens in and around the Proposed Project would be impacted.

O&M and decommissioning would result in the permanent loss of some resources for the long-term, such as biological resources, water, public safety, and visual aesthetics. While there would be irreversible and irretrievable commitments of some resources, as noted above, there would be no permanent loss of the overall productivity of the environment due to the Proposed Project.

# 5. Mitigation

## 5.1. Mitigation Measures

Per the BIA Handbook (2005), analysis of alternatives must include a discussion of mitigation measures where mitigation is feasible, and of any monitoring designed for adaptive management. The purpose of including mitigation measures is to permit a full and accurate comparison of environmental effects of alternatives.

Mitigation of adverse environmental impacts is not required to implement a proposed action. The purposes of NEPA are met by analyzing these impacts and disclosing them to the public in the EIS. The below mitigation measures represent best management practices and technologies, and the most current regulatory guidance to reduce adverse impacts to environmental resources such that the overall Proposed Project will pose minimal significant impact. Results of the NEPA analyses determined that mitigation measures would be implemented for the following resources to meet "minimal effects" measures: Soils, Water Quality, Air, Biological Resources, Cultural Resources, Transportation, and Public Health & Safety.

### 5.1.1. Mitigation Measures – Soils

It was determined in the EIS analysis that the Proposed Project could result in adverse impacts to soils as a result of increased erosion rates and reduction of soil productivity from compaction and mixing of topsoil. Due to grading, placement of solar infrastructure, and general construction practices, wind-blown and water-borne erosion may increase at the site. Digging, drilling, placement of aggregate, road construction, and frequent vehicular travel throughout the Proposed Project would lead to compaction of soils and the inability of vegetation to re-grow. The Applicant would implement the following mitigation measures to reduce overall significant impacts to soil resources:

- Implement a SWPPP – The SWPPP would include BMPs and other erosion-control measures that would adequately maintain soil erosion, limit sheet flow and downstream sedimentation, as well as manage dust suppression by implementing watering and 'stop work' periods during high winds. The SWPPP would also incorporate adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site.
- Implement a Site Restoration and Revegetation Plan – This Plan would limit impacts to native, on-site vegetation as much as practicable. The Plan would define construction limits and BMP measures to ensure off-site seed source does not enter the Proposed Project, and similarly, that on-site cleared vegetation is properly managed through mulching or disposal. The Plan would also outline any restoration

measures that would include soil restoration and re-planting in feasible areas given on-going operations and maintenance. The Plan would also discuss any relocation of yucca and cacti within the Reservation and establish monitoring and success criteria.

### 5.1.2. Mitigation Measures – Water Quality

Potential adverse impacts to water were related to soil erosion and downstream sedimentation as well as water transport of hazardous material through soil erosion. As mentioned above, soil erosion would be managed via the SWPPP, and erosion controls, such as rock weirs or gabions, would be implemented within ephemeral washes to reduce velocity of flood flow and limit downstream sedimentation. Transport of potentially hazardous materials would be managed by the below measures to reduce overall impacts to water quality:

- Adaptive management techniques will be implemented via the SWPPP to maintain BMPs utilized to decrease sediment erosion and downstream transport of such during large rain events. Erosion control measures will be inspected on a weekly basis and within 24 hours of a major rain event (more than ½ inch) to ensure proper working order. Inspection, maintenance and reporting procedures will be outlined in the SWPPP.
- Vegetative buffers will be utilized as much as practical along perimeter edges of major drainages.
- Emergency Response Plan (Construction Phase) – All contractors would be required to abide by this Plan during the construction phase of the Proposed Project. The Plan offers guidelines and procedures for responding to defined emergencies that can threaten the safety and well-being of the contractors and employees during all phases of the Proposed Project; however, it would focus on construction emergencies.
- Spill Prevention, Control, and Countermeasure Plan (SPCC) – This Plan would be adopted and followed during the life of the operations phase of the Proposed Project. The Plan would provide for hazardous material spill prevention and clean-up measures, were a spill to occur.
- To conserve water, xeric landscaping would be used if applicable and low-flow toilets and faucets would be installed within the maintenance and O&M offices.

By implementing the above mitigation measures it is assumed that potentially significant impacts to water resources can be mitigated to a minimal or no adverse impact status.

### 5.1.3. Mitigation Measures – Air

The primary impact upon air would be during the construction and decommissioning period from increased number of vehicle emissions and the presence of fugitive dust. The Proposed Project is located in a non-attainment area for PM-10. Wind-driven emissions of fugitive dust would be generated following disturbances by construction activities, including mobile sources traveling on paved and unpaved roadway surfaces. The following mitigation measures would be implemented to control fugitive dust and reduce overall air impacts as a result of the Proposed Project:

- Minimize grading and vegetation removal, and limit surface disturbance during construction to the time just before module support structure installation;
- Limit vehicular speeds on non-paved roads (Clark County ordinance speed limit is 25 miles per hour);
- Apply water to disturbed soil areas of the Proposed Project to control dust and to maintain moisture level at optimum levels for compaction, as needed. Water will be applied using water trucks. To prevent runoff and ponding, minimize water application rates, as necessary;
- Cover exposed stockpiled material areas during windy conditions (forecast or actual wind conditions of approximately 25 miles per hour or greater), apply dust control measures to haul roads to adequately control wind erosion;
- During periods of high wind, suspend excavation and grading;
- Cover all trucks hauling soil and other loose material or maintain at least 2 feet of freeboard; and
- All paved roads would be kept clean of objectionable amounts of mud, dirt, or debris, as necessary. Gravel or other similar material would be used where dirt access roads intersect the paved roadways to prevent mud and dirt track-out.
- Recommend that all contractors maintain and tune engines per manufacturer's specifications to perform EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies.
- Recommend that contractors lease new, clean diesel burning equipment and perform periodic and unscheduled inspections to limit unnecessary idling and ensure that construction equipment is properly maintained.
- Recommend that contractors use EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutions at the construction site.
- Develop a traffic and parking management plan to minimize traffic interference and maintain traffic flow.

### 5.1.4. Mitigation Measures – Biological Resources

The following measures are recommended to minimize, reduce, and mitigate impacts to biological resources with implementation of the Proposed Project.

- Preconstruction surveys will be conducted by qualified biologists according to the most current USFWS protocols, where available, by species. These surveys will include surveying mowing areas, brush clearing areas, and ground-disturbance areas within habitat deemed suitable for sensitive species by a qualified biologist. These surveys will be conducted for the presence of special status plants, noxious weeds, and general and special status wildlife species, to help prevent direct loss of vegetation and wildlife and to prevent the spread of noxious plant species.

- Biological monitors will be assigned to the Proposed Project in areas of sensitive biological resources and along all utility roads used by Project personnel. The monitors will be responsible for ensuring that impacts on special status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors will flag the boundaries of areas where activities would need to be restricted to protect native plants and wildlife or special status species. Those restricted areas will be monitored to ensure their protection during construction.
- All desert tortoises would be relocated via the Biological Opinion issued by the USFWS to a maximum of 6,000 acre recipient area within the Reservation that will be preserved in accordance with the Biological Opinion. All tortoises would be monitored for five years or a period established by the USFWS and the Biological Opinion. Biological monitors with experience with desert tortoise will be on-site during the construction period where impact to desert tortoise could occur (roads, transmission line ROW, etc.).
- All transmission towers and poles will be designed to be avian-safe in accordance with the Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006). Additionally, a post-construction bird study will be implemented to monitor for incidents of bird strikes during the operation of the Proposed Project. The scope and protocol of the post-construction surveys for the monitoring and reporting of bird strikes will be determined in consultation with USFWS. If the tubular-H design type transmission pole structures are used the horizontal member of the structure will be fitted with an inverted-Y bar to discourage perching. Similar measures will be used to deter nesting if lattice structures are utilized. The following bird and bat conservation strategy measures will also be put into place:
    - Collision

      All potential collision areas of the transmission line corridor would incorporate flight diverters on the static line to make it more visible. Static lines are the smallest diameter lines, and potentially the most difficult for birds to see and avoid. Where any pole requiring guy wires is located near areas of concentrated bird activity, guy wires would be marked to increase visibility where possible. Currently, guy wire locations are not known. Bird diverters are not located on existing guy wires in the area, therefore the assumption is being made that the utility corridor does not experience concentrated bird activity. Post construction monitoring will verify or nullify this assumption. Flight diverters will be installed through adaptive management measures if collision is verified as a cause of mortality. Flight diverter types and locations would be determined through consultation with the BLM, USFWS, and/or NDOW. The number of structures needing the use of guy wires would be kept to a minimum.
    - Anti-Perching and Nesting

To reduce perching along segments of the transmission line, perch deterrents would be installed during construction. Anti-perching and nesting devices are important tools for reducing the risk of avian electrocution and keeping the entire electrical system running smoothly. These deterrents also eliminate the use of transmission lines and transmission line towers as hunting perches for raptor species, limiting the predation of other avian species or animals which use surrounding vegetation for foraging and nesting. Exact locations of perch deterrent poles would be determined in consultation with wildlife agencies prior to construction of the line.

Inspections of lines and other areas where raptor or corvids (crows and ravens) might nest along the transmission lines would be conducted annually. Non-active nests are not protected by MBTA and removal would be conducted prior to the next breeding season. Should nesting activity become a long-term issue, alternate measures to discourage nesting activities should be implemented. Prior to removing or relocating any nests, facility personnel would consult with USFWS and when necessary, proper permitting would be obtained.

- Lighting

  Lighting would be designed to provide minimum illumination needed to achieve O&M objectives and not emit excessive light to the night sky by installing light absorbing shields on top of all light fixtures, and focusing desired light in a downward direction (Reed et al. 1985). This would reduce the visibility of the lights to migratory birds traveling through the area. Downward facing lights would also reduce the number of insects attracted to lights resulting in a decrease of potential concentrated feeding areas for bats. Any additional lighting needed to perform activities such as repairs would be kept to a minimum and only used when these actions are in progress.

- Nest Disturbance and Territory Abandonment

  A qualified biologist would conduct pre-construction nest surveys within 30 days prior to any environmental clearing activities to identify all active nests within the construction area, and the vegetation and habitat type in which each nest is found will be recorded. Environmental clearance activities would be performed primarily before the onset of Phase I construction; however, environmental monitors would be in place during the entire construction period to minimize impacts to natural resources. During the environmental clearance stage trained biologists would relocate bird nests only after young have fledged and perform any mitigation measures necessary to reduce or eliminate negative effects on wildlife species inhabiting the construction area. Activities associated with removal or relocation of nests would be regulated by the USFWS.

  All vegetation clearing and ground scraping activities would be conducted outside the migratory bird nesting season when practical. If ground-disturbing activities cannot be avoided during this time period, pre-construction nest surveys shall be conducted by a qualified biological monitor (USFWS 2010c). For all non-raptor bird species, surveys would cover all potential nesting habitat in and within 300 feet of the area to be disturbed. Any disturbance or harm to active nests would be reported within 24 hours to the USFWS and the BLM, if on BLM lands. The biological monitor may halt work if it is determined that active nests are being disturbed by construction activities and the appropriate agencies would be consulted.

- Evaporation Pond

  The RO process would accumulate approximately 4.2 AFY of discharge that would be temporarily held in an on-site evaporation pond properly sized for the Project's operations. The RO process would accumulate organic chemicals that could potentially harm birds or bats if used as a water source. To eliminate avian and bat use of the evaporation pond at the project site, the pond would be covered with bird proof netting.

- General Housekeeping

  To minimize activities that attract prey and predators during construction and operations, garbage will be placed in approved containers with lids and removed promptly when full to avoid creating attractive nuisances for birds and bats. Open containers that may collect rain water will also be removed or stored in a secure or covered location to not attract birds.

- Monitoring

  The construction of this Project would be completed in three phases. Each phase of construction would be monitored closely for three years after completion in order to determine whether the mitigation measures being used are effective or if they need to be adapted to better fit the needs of the Project. Monitoring periods could be extended if proper progress is not being made in reduction or elimination of avian and bat related incidents.

- A qualified biologist will conduct pre-construction surveys within 30 days prior to construction for Western Burrowing Owl within suitable habitat prior to breeding season (February 1 through August 31). All areas within 250 feet of the Proposed Project will be surveyed, per USFWS 2007 Burrowing Owl guidance.
  - If an active nest is identified, there will be no construction activities within 250 feet of the nest location to prevent disturbance until the chicks have fledged, as determined by a qualified biologist.
  - The occurrence and location of any Western Burrowing Owl will be documented by biological monitors in daily reports and submitted to the authorized biologist on a daily basis. The authorized biologist will report all incidents of disturbance or harm to Burrowing Owls within 24 hours to the USFWS.
- A Worker Environmental Awareness Program (WEAP) will be prepared. All construction crews and contractors will be required to participate in WEAP training prior to starting work on the Proposed Project. The WEAP training would include a review of the special status species and other sensitive resources that could exist in the Proposed Project, the locations of sensitive biological resources and their legal

status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel will be maintained.

- Limiting construction to season when species protected under the MBTA are not breeding or nesting.

- Vehicles and equipment will be cleaned of soil and plant material prior to entering and leaving the work site to minimize the introduction and spread of weeds.

- Gila Monster (specific) - Field workers and personnel will know how to: (1) identify Gila monsters and be able to distinguish it from other lizards such as chuckwallas and western banded geckos (2) report any observations of Gila monsters to the Nevada Department of Wildlife (NDOW); (3) be alerted to the consequences of a Gila monster bite resulting from carelessness or unnecessary harassment; and (4) be aware of protective measures provided under state law.
  - Live Gila monsters found in harm's way on the construction site will be captured and then detained in a cool, shaded environment (<85°F) by the project biologist or equivalent personnel until a NDOW biologist can arrive for documentation, marking and obtaining biological measurements and samples prior to releasing. A clean 5-gallon plastic bucket with a secure, vented lid; an 18"x 18"x 4" plastic sweater box with a secure, vented lid; or, a tape-sealed cardboard box of similar dimension may be used for safe containment. Additionally, written information identifying the mapped capture location, GPS coordinates in Universal Transverse Mercator (UTM) using the North American Datum (NAD) 83 Zone 11. Date, time, and circumstances (e.g. biological survey or construction) and habitat description (vegetation, slope, aspect, substrate) will also be provided to NDOW.
  - Injuries to Gila monsters may occur during excavation, road grading, or other construction activities. In the event a Gila monster is injured, it should be transferred to a veterinarian proficient in reptile medicine for evaluation of appropriate treatment. Rehabilitation or euthanasia expenses will not be covered by NDOW. However, NDOW will be immediately notified of any injury to a Gila monster and which veterinarian is providing care for the animal. If an animal is killed or found dead, the carcass will be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, date, time, habitat, and mapped location (GPS coordinates in UTM using NAD 83 Zone 11).
  - Should NDOW's assistance be delayed, biological or equivalent acting personnel on site should detain the Gila monster out of harm's way until NDOW personnel can respond. The Gila monster should be detained until NDOW biologists have responded. Should NDOW not be immediately available to respond for photo-documentation, a digital (5 mega-pixle or higher) or 35mm camera will be used to take good quality images of the Gila monster in situ at the location of live encounter or dead salvage. The pictures will be provided to NDOW at the address above or the email address below along with specific location information including GPS coordinates, date, time and habitat description. Pictures will show the following information: (1) Encounter location (landscape with Gila monster in clear view); (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster

should fill camera's field of view and be in sharp focus); (3) a clear, overhead close-up of the head (head should fill camera's field of view and be in sharp focus).

### 5.1.5. Mitigation Measures – Cultural Resources

It was determined in the EIS process and through field surveys that the Proposed Project could result in impacts to the prehistoric lithic scatter (26CK9415) that was determined to be non-eligible for listing on the National Register of Historic Places. Although it is not eligible, the Moapa Paiute Tribe could maintain the integrity of this site by implementing the following mitigation measures with the construction contractor prior to survey and construction of the up to 500kV transmission line.

- Prior to survey and construction of the up to 500kV transmission line, authorized personnel will flag and rope off the designated area so that no impacts occur.
- During construction near the known site, an archaeological monitor will be in place to ensure no direct or indirect effects take place at the recorded site.
- Should any unrecorded cultural resources be discovered during construction, all activities within the immediate area of discovery shall cease. The chairman of the Moapa Tribal Council and the BIA Regional Archeologist shall be notified immediately and will make arrangements to assess the nature of the discovered cultural resources and mitigate any damages to any unanticipated discoveries.

### 5.1.6. Mitigation Measures – Transportation

It was determined in the EIS process that the Proposed Project would result in short-term effects on traffic volume and would not adversely affect traffic flow at intersection during peak construction. Given the high numbers of vehicle trips per day (maximum of 876) along with the movement of heavy construction equipment, it is reasonable to anticipate that construction of the Proposed Project could damage public roads through increased use. It is anticipated that short-term impacts to roads during construction could be reduced by implementing the following mitigation:

- Before construction, the Applicant, a BIA representative, a BLM representative and a local representative will document the condition of the access route, noting any pre-construction damage. After construction, any damage to public roads will be repaired to the road's pre-construction condition, as determined by the local representative.
- The Applicant will produce a Traffic Management Plan that identifies BMPs to minimize concurrent construction-related traffic impacts. The Traffic Management Plan will include the following:
    - Deliveries of materials will be scheduled for off-peak hours, when practical, to reduce effects during periods of peak traffic;

- Truck traffic will be phased throughout construction, as much as practical; and
- Promote carpooling or mass transportation options.

### 5.1.7. Mitigation Measures – Public Health & Safety

The potential for human and natural resource exposure to potentially hazardous substances would be a significant impact of the Proposed Project if not addressed adequately. The potential for exposure exists during transportation of materials, direct handling of substances, inadvertent release of hazardous material to the soil and groundwater, and general fire and electrical hazards. By implementing the following plans and regulations, as well as plans previously discussed (SPCC), the Applicant intends to reduce significant impact to public health and safety.

- **General Design and Construction Standards -** The Applicant would design the Proposed Project in accordance with federal and industrial standards including the American Society of Mechanical Engineers (ASME), National Electrical Safety Code (NESC), International Energy Conservation Code (IECC), International Building Code (IBC), Uniform Plumbing Code (UPC), Uniform Mechanical Code (UMC), the National Fire Protection Association (NFPA) standards, and OSHA regulations.
- **Health and Safety Program -** The Applicant would require all employees and contractors to adhere to appropriate health and safety plans and emergency response plans. All contractors would be required to maintain and carry health and safety materials including the MSDS of hazardous materials used on site.
- **Emergency Response Plan -** The Applicant would prepare an Emergency Response Plan based on the results of a comprehensive facility hazard analysis. The Emergency Response Plan would assign roles and actions for on-site personnel and responders and would designate assembly areas and response actions.
- **Hazardous Waste Storage Plan -** The Applicant would prepare a Hazardous Waste Storage Plan that would describe the storage, transportation, and handling of wastes and emphasize the recycling of construction wastes where possible.

Implementation of the above programs, plans, and regulatory policies will result in successful mitigation to adequately minimize or eliminate significant impacts to the construction, operation and maintenance, and decommissioning of the Proposed Project.

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# 6. Consultation and Coordination

## 6.1 Summary of Public Scoping and Issue Identification

### 6.1.1 Public Scoping Period

[illegible]

[illegible]

### 6.1.2 Scoping Meetings

[illegible]

[illegible]

# 6. Consultation and Coordination

## 6.1. Summary of Public Scoping and Issue Identification

### 6.1.1. Public Scoping Period

On Friday, February 4, 2011, the BIA published the Notice of Intent (NOI) to prepare an EIS for the Proposed K Road Moapa Solar Facility in Clark County, Nevada in the Federal Register, Vol. 76, No. 24. The NOI announced a public scoping period for alternatives, issues, impacts, and planning criteria. The 30-day scoping period for the Proposed Project was initiated by the NOI and was completed on March 7, 2011.

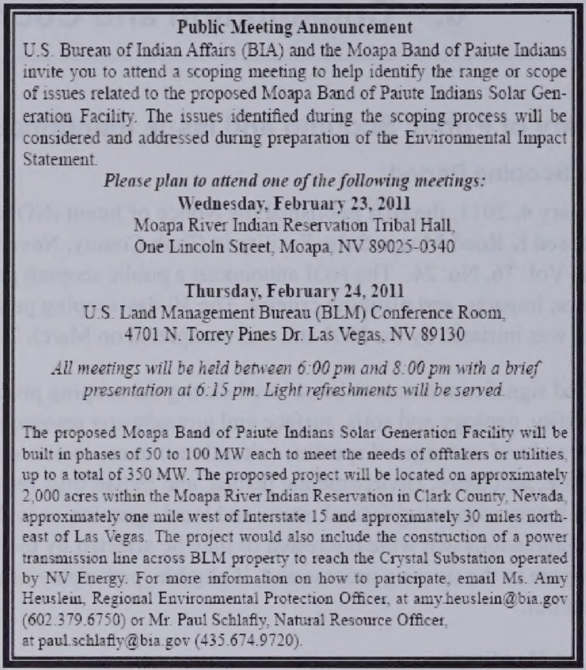
The BIA identified significant issues to be covered during the scoping process as, but not limited to: air quality, geology and soils, surface and groundwater resources, biological resources, threatened and endangered species, cultural resources, socioeconomic conditions, land use, aesthetics, environmental justice, and Indian trust resources. In addition, 49 NOI letters requesting federal, state, and local agencies, as well as individuals or organizations that were interested or may be affected by the Proposed Project, to participate in the scoping process and, if eligible, participate as a cooperating agency, were sent out.

### 6.1.2. Scoping Meetings

In order meet the requirements of the environmental review process, verbal and written comments on the Proposed Project were accepted from February 5 until March 7, 2011. To facilitate collection of the comments the BIA held two public scoping meetings near the Proposed Project. The first meeting was held on the Reservation on February 23, 2011 from 6 pm until 8 pm. The first meeting had 29 attendees. The second meeting was held at the BLM North Las Vegas Office on February 24, 2011 from 6 pm until 8 pm. The second meeting had 26 attendees. Notices were published in the Moapa Valley Progress and the Las Vegas Newspaper the week before the public meetings (see Figure 6-1).

Format of the meetings included an introduction from the Chairman of the Tribe, a presentation by the BIA describing its role as lead agency in administering the NEPA process and proposed Lease Agreement.

**Figure 6-1: Newspaper Notice**



**Public Meeting Announcement**

U.S. Bureau of Indian Affairs (BIA) and the Moapa Band of Paiute Indians invite you to attend a scoping meeting to help identify the range or scope of issues related to the proposed Moapa Band of Paiute Indians Solar Generation Facility. The issues identified during the scoping process will be considered and addressed during preparation of the Environmental Impact Statement.

*Please plan to attend one of the following meetings:*

**Wednesday, February 23, 2011**
Moapa River Indian Reservation Tribal Hall,
One Lincoln Street, Moapa, NV 89025-0340

**Thursday, February 24, 2011**
U.S. Land Management Bureau (BLM) Conference Room,
4701 N. Torrey Pines Dr. Las Vegas, NV 89130

*All meetings will be held between 6:00 pm and 8:00 pm with a brief presentation at 6:15 pm. Light refreshments will be served.*

The proposed Moapa Band of Paiute Indians Solar Generation Facility will be built in phases of 50 to 100 MW each to meet the needs of offtakers or utilities, up to a total of 350 MW. The proposed project will be located on approximately 2,000 acres within the Moapa River Indian Reservation in Clark County, Nevada, approximately one mile west of Interstate 15 and approximately 30 miles northeast of Las Vegas. The project would also include the construction of a power transmission line across BLM property to reach the Crystal Substation operated by NV Energy. For more information on how to participate, email Ms. Amy Heuslein, Regional Environmental Protection Officer, at amy.heuslein@bia.gov (602.379.6750) or Mr. Paul Schlafly, Natural Resource Officer, at paul.schlafly@bia.gov (435.674.9720).

The environmental consulting firm preparing the EIS on behalf of the BIA, ARCADIS-US/Malcolm Pirnie, explained the technical aspects of the Proposed Project, including: extent, design, possible resource impacts (to be addressed in the DEIS), project benefits, and described the process for public involvement. At the end of the presentation the BIA invited the public to provide verbal comments on the Proposed Project.

An open house was held after the presentation to allow participants to review displays, maps, and literature, as well as to meet members of the EIS team, BIA staff, and Tribe. To encourage public comment, a court reporter was present at both meetings to record events and take verbal comments. In addition, pre-addressed comment cards and information pamphlets were distributed to meeting attendees. Pamphlets and comment cards contained a link to a project-specific website that displayed information on the Proposed Project and allowed viewers to submit comments directly through the website. The Scoping Report provides details on the proceedings of the scoping meetings (see Appendix L).

In addition to verbal comments and written comments received during these scoping meetings, the BIA received electronic comment letters and/or emails from private citizens, EPA, and the Center for Biological Diversity through the mailing address and e-mail address provided on the NOI.

### 6.1.3. Scoping Response

As stated above, verbatim transcripts of each public scoping meeting were recorded and written electronic comments received during the scoping period were catalogued. These transcripts can be found in the Scoping Report (Appendix L). Issues raised by the public and other agencies during the scoping process are included in the following table:

**Table 6-1.**
**Public and Agency Scoping Responses**

| Agency or Other | Comment |
|---|---|
| EPA | The U.S. Environmental Protection Agency (EPA) supports the increase in renewable energy resource development, as recommended in the National Energy Policy Act of 2005. Using renewable energy resources, such as solar power, can help the nation meet its energy requirements without generating greenhouse gas emissions.<br>Our main interest is that impacts to ephemeral streams (desert washes) be minimized because of the water quality and habitat benefits these resources provide. |
| EPA | Consistent with 40 CFR § 1502.14(f), EPA recommends an alternative be developed having a project configuration that avoids impacts to ephemeral drainages or desert washes to the maximum extent possible. |
| EPA | Efforts to preserve vegetation and habitat should be pursued. In arid areas, disturbed vegetation is slow to recover. It may be possible to mount PV panels at sufficient height above ground to maintain natural vegetation and drainage. Practices that preserve habitat, minimize weed invasion, and prevent erosion should be incorporated into the project. |
| EPA | There are currently many solar energy projects being proposed on Bureau of Land Management (BLM) land in the desert southwest. The analysis of cumulative impacts should consider these other projects, in addition to other developments in the area and general resource trends, on the resources that would be affected by the proposed project. As mentioned, cumulative impacts to desert washes and ecosystems are occurring and will continue to occur from multiple large solar installations in the desert, therefore cumulative impacts to this resource should be thoroughly discussed for this project. We also recommend thorough discussions of cumulative impacts to water resources and the Desert Tortoise. |
| Center for Biological Diversity | The development of renewable energy is a critical component of efforts to reduce carbon pollution and climate-warming gases, avoid the worst consequences of global warming, and to assist in meeting needed emission reductions. The Center strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular. However, like any project, proposed solar power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitat, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable. |

**Table 6-1 Continued**

| Agency or Other | Comment |
|---|---|
| Center for Biological Diversity | Impacts on desert tortoise. The desert tortoise is protected as Threatened under the Endangered Species Act. The desert tortoise is continuing to decline throughout its range despite being under federal and state Endangered Species Acts protection as threatened. The project area lies in the Northeastern Mojave Recovery Unit for the desert tortoise, within potential occupied habitat, and outside of areas designated as critical habitat. Typically, as part of the preparation of the site for solar energy development, mass grading and leveling would be required, that would destroy tortoise habitat and render it unsuitable in perpetuity. Even if mass grading were not done, the habitat would be significantly degraded. |
| Center for Biological Diversity | The Scientific Advisory Committee (SAC) of the U.S. Fish and Wildlife Service's Desert Tortoise Recovery Office has recently concluded that "translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option. When considered, translocation should be part of a strategic population augmentation program, targeted toward depleted populations in areas containing "good" habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of "depleted" (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified. Augmentations may also be useful to increase less depleted populations if the goal is to obtain a better demographic structure for long-term population persistence. Therefore, any translocations must be accompanied by specific monitoring or research to study the effectiveness or success of the translocation relative to changes in land use, management, or environmental condition. Translocation should be used as a tool to augment populations within depleted recovery units, not as a mitigation strategy to allow for development in desert tortoise habitat. |
| Center for Biological Diversity | There are at least two rare plant species of potential concern, the threecorner milkvetch (*Astragalus geyeri)* and the Las Vegas bearpoppy (*Arctomecon californica)*. Both are state listed under NRS 5427.260 as critically endangered and are BLM special status species. They are also considered by the Nevada Native Plant Society as meeting the federal definition for listing under the Endangered Species Act.<br>At least two years of plant surveys should be conducted to confirm the absence of the species and if found to be present, protective measures should be established to avoid, minimize and mitigate impacts. |
| Kern River Gas Transmission Company | To not interfere with the existing gas line: construct transmission line so that conductors do not overhang into Kern River ROW; access road should cross the pipeline ROW at a 90 degree angle, the crossing should be padded; use "One Call" before construction; determine if alternating current interference will result from project; complete an encroachment permit between Applicant and Kern River; Kern River will have a technician on site during construction. |

### 6.1.4. Mailing List

A mailing list was initially assembled from agencies, organizations, and other persons who expressed interest in being added to the mailing list during and after scoping. The mailing list for the Proposed Project contains a total 49 agencies, organizations, and individuals. The mailing list will be revised to add any party who provides comments on the DEIS and/or requests that they be added to the mailing list.

The following is the initial mailing list:

Josh Reid
Brownstein Hyatt Farber Schreck, LLP
100 North City Parkway
Suite 1600
Las Vegas, NV 89106-4614

Amy Heuslein
Bureau of Indian Affairs
Western Regional Office Branch of
Environmental Quality Services
2600 North Central Avenue
4th Floor Mail Room
Phoenix, AZ 85004-3008

Karen Vitulano
USEPA Region 9 – Communities and
Ecosystems Division
75 Hawthorne Street, CED – 2
San Francisco, CA 94105

Mark Chandler
Bureau of Land Management
Las Vegas Field Office
4701 North Torrey Pines Drive
Las Vegas, NV 89130

Christina M. Varela
Assistant Realty Specialist
Southern Paiute Agency
Bureau of Indian Affairs
P.O. Box 720
St. George, UT 84771

Kellie Youngbear
Agency Superintendent
Southern Paiute Agency
Bureau of Indian Affairs
P.O. Box 720
St. George, UT 84771

William Anderson
Chairman
1 Lincoln Street
PO Box 340
Moapa, NV 89025

Steve Cooke
Chief, Environmental Services Division
Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Patricia McQueary, Project Manager
US Army Corps of Engineers
St. George Regulatory Office
321 N Mall Drive, Suite L-101
St. George, Utah 84790

Michael Burroughs
US Fish and Wildlife Service
Southern Nevada Field Office
4701 North Torrey Pines Drive
Las Vegas, NV 89130

The Nature Conservancy
1771 East Flamingo Road, Suite 104 A
Las Vegas, NV 89119

John Hiatt – Conservation Committee Chair
Red Rock Audubon Society
PO Box 96691
Las Vegas, NV 89193

Ray Nelson – President
Board of Trustees
Lahontan Audubon Society
P.O. Box 2304
Reno, NV 89505

Desert Tortoise Council
PO Box 3273
Beaumont, CA 92223

Friends of Nevada Wilderness
PO Box 33155
Las Vegas, NV 89133
Nevada Wilderness Project
Southern Nevada Office
7465 West Lake Mead Blvd Suite #105
Las Vegas, NV 89128

Sierra Club
732 South 6th Street
Las Vegas, NV 89101-6948

Sierra Nevada Alliance
PO Box 7989
South Lake Tahoe, CA 96158

Nevada Clean Energy Campaign
Emily Rhodenbaugh
Conservation Organizer
250 Bell Street
Reno, NV 89503

Center for Energy Efficiency and Renewable Technologies
1100 11th Street, Suite 311
Sacramento, CA 95814

Environment America
3435 Wilshire Blvd. #385
Los Angeles, CA 90010

Environmental Defense Fund
1107 9th Street, Suite 540
Sacramento, CA 95814

Great Basin Resource Watch
85 Keystone Avenue, Suite K
Reno, NV 89503

Nevada Wildlife Federation
PO Box 71238
Reno, NV 89570

Natural Resources Defense Council
1314 Second Street
Santa Monica, CA 90401

Nevada Conservation League
7473 West Lake Mead Blvd
Suite 100
Las Vegas, NV 89128

Western Resource Advocates
204 North Minnesota Street
Suite A
Carson City, NV 89703

Center for Biological Diversity
PO Box 710
Tucson, AZ 85702-0710

Nevada Department of Wildlife
Southern Region
4747 Vegas Drive
Las Vegas, NV 89108
Nevada Natural Heritage Program
901 South Stewart Street
Suite 5002
Carson City, NV 89701-5245

Nevada Department of Conservation and Natural Resources
Las Vegas Office
2030 E Flamingo Rd, Ste 230
Las Vegas, NV 89119-0837

Clark County Department of Comprehensive Planning
Clark County Government Center
500 South Grand Central Parkway
Las Vegas, NV 89155

Nevada Department of Air Quality and Environmental Management
Clark County Government Center
500 South Grand Central Parkway
Las Vegas, NV 89155

Nevada Natural Resource Education Council
PO Box 4741
Carson City, NV 89702-4741

Department of Air Quality and Environmental Management
Clark County Desert Conservation Program
Clark County Government Center
500 South Grand Central Parkway
Las Vegas, NV 89155-5201

Clark County Regional Flood Control District
600 South Grand Central Parkway
Suite 300
Las Vegas, NV 89106-4511

Nevada Division of Environmental Protection
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701–5249

Natural Resource Conservation Service
Mojave Special Projects Office
Parc Place Professional Complex
5820 South Pecos Road
Building A, Suite 400
Las Vegas, NV 89120

Nevada Energy
Environmental Department
PO Box 98910
Las Vegas, Nevada 89151-0001

Nevada Energy
Corporate Headquarters
Environmental Department
6226 West Sahara Avenue
Las Vegas, Nevada 89146

Conservation District of Southern Nevada
5820 South Pecos Road A-400
Las Vegas, NV 89120

The Conservation Alliance
PO Box 1275
Bend, OR 97709

Friends of Gold Butte
Nancy Hall, President
PO Box 3664
Mesquite, NV 89024

Nevada State Historic Preservation Office
100 North Stewart Street
Carson City, NV 89701-4285

Nevada Environmental Coalition, Inc
10720 Button Willow Drive
Las Vegas, NV 89134

Union Pacific Railroad Company
91 North Gibson Road
Henderson, NV 89014

Southern Nevada Water Authority
1001 S. Valley View Blvd
Las Vegas, NV 89153

Nellis Air Force Base
99 ABW/PA
4430 Grissom Avenue
Suite 107
Nellis AFB, NV 89191

Professor Paul Friesema
Environmental Policy and Culture Program
227 Scott Hall, Northwestern University
Evanston, IL.60208-1006

## 6.2. Public Participation Summary

### 6.2.1. Distribution of the Draft EIS

The DEIS review period was initiated by publication of the Notice of Availability (NOA) for the DEIS in the *Federal Register* on November 25, 2011 and comments were accepted for a 45 day period that ended on January 9, 2012.

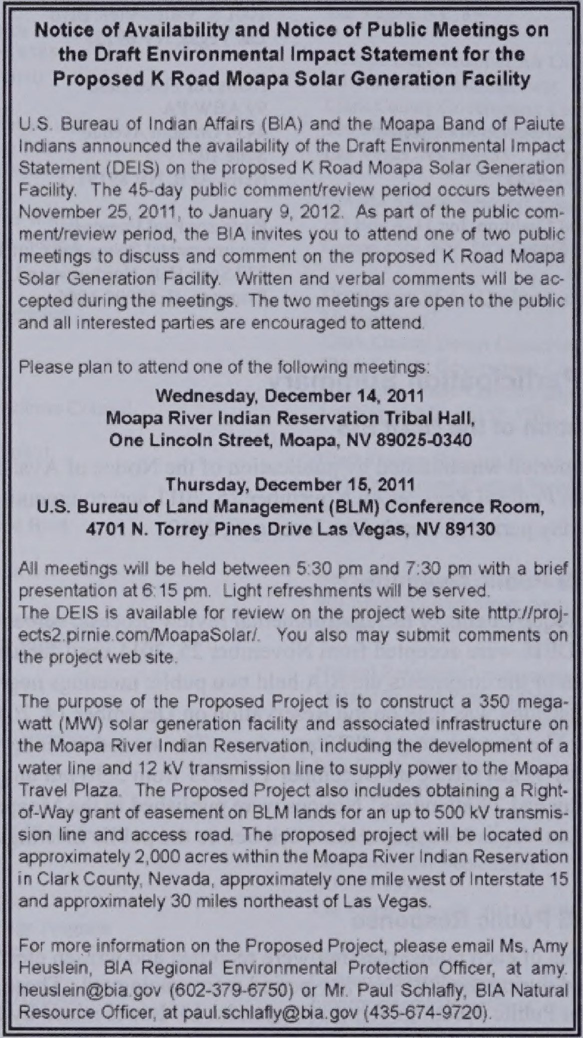
### 6.2.2. Draft EIS Public Meetings

In order meet the requirements of the environmental review process, verbal and written comments on the DEIS were accepted from November 25, 2011 until January 9, 2012. To facilitate collection of the comments the BIA held two public meetings near the Proposed Project. The first meeting was held on the Reservation on December 14, 2011 from 5:30 pm until 7:30 pm. The first meeting had 25 attendees. The second meeting was held at the BLM North Las Vegas Office on December 15, 2011 from 5:30 pm until 7:30 pm. The second meeting had 24 attendees. Notices were published in the Moapa Valley Progress and the Las Vegas Newspaper the week before the public meetings (see Figure 6-2).

### 6.2.3. Draft EIS Public Response

Verbatim transcripts of each public meeting were recorded and written electronic comments received during the DEIS review period were catalogued. These transcripts can be found in the Public Meetings Report (Appendix L). Issues raised by the public and other agencies during the DEIS review processes are included in Table 6-2.

**Figure 6-2: Newspaper Notice**



## Notice of Availability and Notice of Public Meetings on the Draft Environmental Impact Statement for the Proposed K Road Moapa Solar Generation Facility

U.S. Bureau of Indian Affairs (BIA) and the Moapa Band of Paiute Indians announced the availability of the Draft Environmental Impact Statement (DEIS) on the proposed K Road Moapa Solar Generation Facility. The 45-day public comment/review period occurs between November 25, 2011, to January 9, 2012. As part of the public comment/review period, the BIA invites you to attend one of two public meetings to discuss and comment on the proposed K Road Moapa Solar Generation Facility. Written and verbal comments will be accepted during the meetings. The two meetings are open to the public and all interested parties are encouraged to attend.

Please plan to attend one of the following meetings:

**Wednesday, December 14, 2011**
**Moapa River Indian Reservation Tribal Hall,**
**One Lincoln Street, Moapa, NV 89025-0340**

**Thursday, December 15, 2011**
**U.S. Bureau of Land Management (BLM) Conference Room,**
**4701 N. Torrey Pines Drive Las Vegas, NV 89130**

All meetings will be held between 5:30 pm and 7:30 pm with a brief presentation at 6:15 pm. Light refreshments will be served.
The DEIS is available for review on the project web site http://projects2.pirnie.com/MoapaSolar/. You also may submit comments on the project web site.

The purpose of the Proposed Project is to construct a 350 megawatt (MW) solar generation facility and associated infrastructure on the Moapa River Indian Reservation, including the development of a water line and 12 kV transmission line to supply power to the Moapa Travel Plaza. The Proposed Project also includes obtaining a Right-of-Way grant of easement on BLM lands for an up to 500 kV transmission line and access road. The proposed project will be located on approximately 2,000 acres within the Moapa River Indian Reservation in Clark County, Nevada, approximately one mile west of Interstate 15 and approximately 30 miles northeast of Las Vegas.

For more information on the Proposed Project, please email Ms. Amy Heuslein, BIA Regional Environmental Protection Officer, at amy.heuslein@bia.gov (602-379-6750) or Mr. Paul Schlafly, BIA Natural Resource Officer, at paul.schlafly@bia.gov (435-674-9720).

## Table 6-2.
## Public and Agency DEIS Comments

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 1 | Tribe | Has K Road thought to erect a transfer station pre & post construction to handle trash (recycle materials: plastic, aluminum cans, construction materials). Transfer station a fenced compound with recyclable bins with lids to keep crows and vector controls in check. | Transfer station(s), not specifically called out in the DEIS, will be utilized during construction and put in place permanently upon operation. These details will be discussed in the Hazardous Materials Plan, Stormwater Pollution Prevention Plan (SWPPP), and documented in the Bird and Bat Conservation Strategy document. The SWPPP and Hazardous Material Plan will be developed and approved by the appropriate agency prior to construction. |
| 2 | Tribe | Possible pave or Type 2 gravel on access road to facility to minimize dust abatement. Also, with paved or Type 2 material on access road tortoises become more visible. | Gravel will be used on the access road as outlined in Chapter 4, Section 4.2.2 of the FEIS. Biological monitors will be in place (Section 4.8.3.1) along access roads as well as other mitigation measures to ensure safety to Desert Tortoise (DETO) as outlined in the DETO Translocation Plan. |
| 3 | Tribe | Look at seasonal speed limit signs for tortoise activity. | Vehicular speeds will not exceed 25mph as dictated in the DETO Translocation Plan. Speed limit signs will be posted along the access road. This has been updated in Chapter 4, Section 4.8.4.1. |
| 4 | USGS | The U. S. Geological Survey has reviewed the Draft EIS for the Proposed K Road Moapa Solar Generation Facility, Clark County, Nevada. In this regard, we have no comments at this time. | Thank you, your comment is noted. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 5 | National Parks Service | We believe that you should refer to the National Trail System Act, and describe agency roles in the administration of National Historic Trails in your legal mandate descriptions in the appendices. The legal reference is 16 USC 1251. | We have added a description of the National Trails System Act in Appendix A, Section 1.1.6.9. |
| 6 | National Parks Service | We strongly prefer the western optional location eliminated from detailed analysis shown on Figure 2-3 because it would have little to no visual effect to the Old Spanish NHT viewshed. We wonder why this optional location was not analyzed as an action alternative instead of being arbitrarily eliminated. | The optional location was dismissed for several reasons as stated in Chapter 2, Section 2.3.3.1.<br>The Visual Assessment, in Chapter 4, Section 4.13.4 has been updated to accurately address visual impacts from the newly mapped trail. |
| 7 | National Parks Service | On page 3-52 and 4-59, you combine the Mormon Road and the Old Spanish Trail together as the "Old Spanish Trail/Mormon Road National Historic Trail." This is not accurate. The term "National Historic Trail" is a specific legal designation. In this area the only National Historic Trail is the Old Spanish National Historic Trail. Congress designated the route of the Old Spanish National Historic Trail, not the National Park Service, and not the Bureau of Land Management, nor is either agency empowered to arbitrarily change the designated route shown on the maps that were part of the Act passed by Congress, add or remove segments, or change its name. The period of significance for the Old Spanish National Historic Trail is 1829-1848. What was later termed the Mormon Road is later and is not associated with the events that made the Old Spanish Trail nationally significant. We would suggest the wording "Old Spanish National Historic Trail/Mormon Road" if you wish to combine the two, or just leave out the words "National Historic Trail" if you wish to refer to the generic version of the trail, as in the McBride and Rolf 2001 National Register nomination. | We accept this comment and have referred to the route designated by Congress as the Old Spanish National Historic Trail. Other trail segments in the vicinity of the proposed project are referred to as Old Spanish Trail/Mormon Road. We have changed the descriptions in the text (Chapter 3, Section 3.9.1) to accurately make this distinction as advised by NPS. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 8 | National Parks Service | You state on page 3-52 that you asked the Old Spanish Trail Association about the trail, and published the letter you sent them, to which they apparently did not respond, since no response is published. If they did not respond, you should probably state that, rather than stating, "Inquiries to the National and local chapters of the Old Spanish Trail Association regarding the Old Spanish Trail corridors in the Proposed Project area resulted in no concerns." No response is not quite the same thing as no concerns. If the Association did respond, please publish their communication. | The Association did not formally respond to our letter; however, the Association's Nevada Chapter President did participate in a site visit prior to the public meeting and verbally expressed comfort with the proposed project's effects, or lack thereof, on the Old Spanish Trail/Mormon Road and, by extension, the Old Spanish NHT. We agree that no response is not the same as no concern. The text in Chapter 3, Section 3.9.1 has been revised. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 9 | National Parks Service | On page 3-53, you state that "No segments contributing to the eligibility or significance of either of these properties have been identified in the study area." This statement is not accurate. In fact, there is a high-potential route segment of the Old Spanish NHT identified in our draft Comprehensive Management Plan for the trail that lies immediately south and adjacent to the project area called the California Crossing High Potential Route Segment. A high-potential route segment is defined in the National Trail System Act as a segment of a trail which would afford high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route. A high potential route segment does contribute to the significance of the trail. It is the opinion of NTIR that this undertaking, particularly the transmission line and facilities, may have adverse visual effects on this high potential route segment. The transmission towers are up to 150 feet high and would be visible for many miles. None of your visual effects key observation points were taken along this high potential route segment, which lies between your KOP 1 and KOP 3. We request that additional visual effects analysis be conducted for the effects of the transmission lines and the solar plant on the viewshed of the California Crossing high potential route segment. | This segment of the Old Spanish NHT has been updated in Figure 3-14 with the GIS data sent by the NPS. These data show that the Old Spanish NHT is on the opposite side of I-15 between KOP 1 and 3. The GIS data also show both KOP 4 and 5 are within ½ mile of the Old Spanish NHT. Visual simulations from these locations are deemed fair representations from the perspective of the Old Spanish NHT and adequate to make a 'no impact' statement. Figure 3-14 also shows that the solar facility and transmission structures are not visible from a majority of the Old Spanish NHT for that six mile segment closest to the project area. All transmission towers will be placed adjacent (as much as practical) to the existing, two 500kV transmission line tower structures currently within the utility corridor. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 10 | National Parks Service | On page 4-60, you state, "A segment of the original Old Spanish Trail route has been located south of the Proposed Project area along the California Wash by the BLM, but not formally documented, that is more accurate than the current National Park Service route." This subjective and unattributed statement is incorrect on several counts.<br>• First, since it is not formally documented, there is no particular reason to think that the indicated segment is associated with the Old Spanish National Historic Trail at all, or that is accurately mapped in any way. No evidence is presented as to its date, no documentary evidence is presented as to its association with the events that make the Old Spanish Trail significant, and no historic maps or other evidence are presented showing the location of this alleged segment at any particular period in time. In the absence of any real evidence, this is just another old trail segment that could be anything, and should not be considered part of the Old Spanish National Historic Trail.<br>• Secondly, the National Park Service did not designate the current route, Congress did. Until Congress alters the act that created the Old Spanish National Historic Trail, the route they identified on the maps associated with the law they passed is the official route of the Old Spanish National Historic Trail. Agencies are not empowered to alter the route arbitrarily based on opinion. When additional segments are proposed for addition to a National Historic Trail, they are studied and evaluated, and if legitimate, the results are presented for congressional action to add them to the particular National Historic Trail. | This incorrect and unverified information in Chapter 4, Section 4.9 has been modified in response to this comment. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 11 | National Parks Service | Your KOP 5 is thus not on the Old Spanish National Historic Trail, so please clarify this. | KOP 5 is ½ mile east of the Old Spanish NHT. The text has been clarified in Chapter 4, Section 4.9.2. |
| 12 | National Parks Service | NTIR realizes that reserved tribal lands are sovereign, and we have no wish to interfere with tribal activities. We support the concept of alternative energy generation. Photovoltaic facilities of the type proposed are generally not as high off the ground as some alternative energy generating equipment and would thus be highly preferable to other solar technologies in terms of visual effects. However, we are concerned that the setting of the California Crossing high potential route segment of the Old Spanish National Historic Trail could be adversely affected by visual impacts and contrast from transmission lines running off the site, with poles up to 150 feet tall, substations, maintenance structures, maintenance roads, and associated noise, dust, or light from the proposed site. We request that additional visual effects analysis be conducted for the effects of the transmission lines and the solar plant from the California Crossing high potential route segment. | See response to Comment #10 |
| 13 | National Parks Service | Additionally, we request that the errors in the administrative and descriptive language described above be corrected for the Final Environmental Impact Statement. | Changes have been made accordingly in Chapter 3, Section 3.9.1 and Chapter 4, Section 4.9.2. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 14 | Nevada Department of Wildlife | Overall, the measures to mitigate and manage construction and operation of the facility and appurtenances as they relate to biological resources are satisfactory as expected. The Department is supportive of the use of tubular-H design of 345kV and 500kV transmission structures as opposed to lattice-style designs. While time and cost considerations were identified, the Department believes that the tubular-H design would be most effective in discouraging subsidy of perch and nest sites to raptors and ravens mindful of the increased potential for predation on desert tortoises and other small wildlife. The horizontal member of the transmission structure should be fitted with an inverted-Y bar on top that discourages perching. This is in line to considerations by Prather & Messmer (2010). See attached NDOW comment letter for citation. | Text has been added in Chapter 5, Section 5.1.4 to include inverted Y-bars to discourage perching should tubular H design structures or similar be used for the Project. |
| 15 | Nevada Department of Wildlife | Indirect significant impacts are stated possibly affecting Moapa Dace as a result of groundwater pumping. How will the project proponent avoid and monitor for connectivity and indirect affects to water and wildlife resources of the nearby Warm Springs area and the Muddy River system? | Monitoring for connectivity and indirect effects will not occur. Past hydraulic studies identified in Chapter 4, Section 4.8.4.1 for the Calpine Project result in no affect as a result of pumping 7,000AFY. The solar project proposes only 72AFY during construction and therefore will not have affect to the Muddy Rivers System. Incidental take to the Moapa Dace is fully addressed in the Biological Opinion provided by the USFWS. |
| 16 | Nevada Department of Wildlife | The document does not fully describe groundwater connectivity between the project site hydrographic basins of Garnett Valley and California Wash to the Muddy River-Warm Springs area. The Warm Springs area harbors breeding populations of the southwestern willow flycatcher and yellow-billed cuckoo as well as the Moapa Dace. | Groundwater connectivity is not relevant other than what is stated in the DEIS and described in response to Comment # 15. |

### Table 6-2 Continued

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 17 | Nevada Department of Wildlife | In reviewing species descriptions, common and scientific nomenclature used was either misspelled or indicated inaccurate representation of wildlife for the project area and vicinity. Reviewing the botanical descriptions showed similar problems. Attention to this would strengthen the scientific credibility of the document. | Nomenclature has been verified and updated for misspelling. Representation of some flora and fauna is due to applicable U.S. Fish and Wildlife County listed T&E species. |
| 18 | Nevada Department of Wildlife | Mindful that context of the wild burro description was to the Muddy HMA, 20 miles distant from the project site, it should be understood that while wild burros are a biological resource, they are not defined as wildlife by either federal or state laws and should be removed from section 3.8.2.1. | We understand that the biological technicality may be that wild burros are a "feral" rather than a "wild" animal but nevertheless protected under the Wild Free-roaming Horses and Burros Act, Pub. L. 92-165, 16 U.S.C. 1331-1340, ("Wild Horse and Burro Act"). The U.S. Supreme Court upheld the constitutionality of the Act (and the horses and burros may be legally called "wild") *Kleppe v. New Mexico*, 426 U.S. 529 (1976). |
| 19 | Nevada Department of Wildlife | • The only clear distinction between these two sections (3.8.3 & 3.8.4) is that faunal species are addressed in 3.8.3 and floral species are addressed in 3.8.4. Otherwise the distinction in the use of the term *Special Status Species* is unclear.<br>• Consulting the October 2011 listing of Nevada BLM Sensitive Species would help update considerations for species addressed in these sections as well as section 3.8.2.1. | Chapter 3, Section 3.8.3 header has been changed to address the entire range of State listed and BLM Special status species; thus deleting the 3.8.4 header. |

### Table 6-2 Continued

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 20 | Nevada Department of Wildlife | For lands affected by the project not located on tribal lands (i.e. BLM right-of-way), inclusive of considerations relevant to the anticipated *Desert Tortoise Relocation Plan* (Appendix B), a Special Purpose Permit must be obtained if desert tortoises are encountered and need to be moved out of harm's way as per NAC 503.093 and NRS 503.597. | Noted: this permit will be applied for that portion of the Project not on the Reservation by the Proponent. The Permit Table 1-3 has been updated in Chapter 1. |
| 21 | Nevada Department of Wildlife | In addition with measures implemented to avoid conservation conflicts with species similar to the desert tortoise, inclusion of the Department's Gila monster protocol as part of project worker education and biological monitoring is recommended. The Gila monster protocol is accessible online at: http://www.ndow.org/wild/conservation/reptile/07Gila_Protocol.pdf. | Gila monster protocol has been incorporated into the FEIS Chapter 3, Section 3.8.3. |
| 22 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | Additional desert tortoise surveys should be conducted this spring to better determine tortoise density. | The decision to not complete further Spring surveys was concluded after consultation with the USFWS. The Desert Tortoise Translocation Plan that was prepared following the USFWS Guidance Document and is subject to their oversight and approval. The Plan describes the flexibility of translocating additional tortoises if the projected density has been underestimated. The October survey was considered adequate for preparing this plan. |

### Table 6-2 Continued

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 23 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The DEIS states that a translocation plan will be developed along with a Biological Opinion required by the ESA. Such plan should heed the above warning (see attached Conservation Group Formal Letter – Scientific Advisory Committee statement, pg. 4), and include the called for specific monitoring and research. We further request that the translocation plan be made available for public review and comment prior to final decision being made on this project. | This plan will be included as Appendix B of the FEIS, and publicly available prior to the Record of Decision. |
| 24 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | We are further concerned that the proposed 6,000 acre recipient site does not provide adequate quality desert tortoise habitat. The tortoise habitat on the Project site should be analyzed to determine if it is Category I or II habitat for desert tortoise. While we agree that a direct comparison of numbers is clouded by a difference in survey protocols used, we are nonetheless concerned that any translocation site has the quality habitat and the capacity to absorb the number of tortoises envisioned to be in need of translocation. | Surveys indicate that the species composition of the translocation site is comparable to the project site where removal will occur. Care will be taken to insure that each translocated tortoise is provided the average acreage for its habitat. Further, qualitative and quantitative vegetation studies will be conducted in Spring for this purpose and to be taken into consideration while drafting the DETO disposition plan. |
| 25 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | Any translocation site must be protected from degradation in perpetuity. Translocation land should be preserved on the Tribal Lands off-site of the Project in a ratio of several acres preserved in perpetuity for every acre disturbed by the Project, with the Tribe and the Department of the Interior to commit to taking all legal actions to preserve such land in perpetuity (including, but not limited to the execution and approval of perpetual conservation easements and/or amendments to the Tribal Ordinance). The Tribe indicated that the recipient site would not be fenced, leading to further concerns on what regulatory or other mechanism will ensure the long term protection of the site and the resident tortoises. This issue must be satisfactorily addressed in the final EIS and decision. | There are plans to protect the translocation site through Tribal Ordinance, which will be on tribal lands through the life of the project. Land area required is based on the average acreage required for each individual tortoise and the number of tortoises relocated. The translocation site is three times larger than the Proposed Project site. Text has been updated in Chapter 5, Section 5.1.4. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 26 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | Another issue related to translocation is that of the disposition of individuals that are seropositive when given an enzyme-linked immunosorbent assay. Hudson and others postulate that in some cases a serpositive indication may merely be an indication of high natural immunity or a survivor of a previous infection rather than an infectious individual. Hudson offers recommendations related to translocation which should be incorporated into the translocation plan and implemented. We also urge that a formal well-designed study of the long-term survival of translocated tortoises be required as a mitigation measure by the proponent to test whether there are any differences among asymthematic serpositive individuals and asymthematic sernegative individuals. | The disposition of seropositive animals will be included in the Desert Tortoise Disposition Plan. The Service will consider release of seropositive animals that otherwise appear healthy based on a thorough health assessment.<br>The Monitoring Plan for translocated tortoises will be contained in the Translocation Plan and will require approval by the USFWS. |
| 27 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | During October 2012 desert tortoise surveys, three burrowing owl burrows were noted, although in cliffs, where solar infrastructure would presumably not be located. Burrowing owls should be passively relocated to the extent their burrows are impacted. | Burrowing owls will be passively relocated out of harm's way. This verbiage will be added to the FEIS in Chapter 3, Section 3.8.3. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 28 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | Plant surveys should be conducted for Beaverdam breadroot, three-corner milkvetch, sticky buckwheat, rosy twotoned penstemon, and white bearpoppy during spring flowering periods and any found plant locations geospatially mapped. | Plant surveys will take place within the entirety of the BLM utility issued ROWs and within random quadrants within the proposed solar facility as well as the primary and secondary recipient areas. The best available information and previous survey data were used for EIS analysis, because of limitations associated with these data and the project schedule, Per Chapter 4, Section 4.8.4, Surveys for these plants would be conducted prior to any construction of the Proposed Project (Spring 2012) by a BLM approved biologist. Impacts to documented plants would be avoided if practical or reduced through use of construction BMPs and habitat restoration. If impacts cannot be avoided then impacts would be mitigated through seed collections from affected populations and a potential sponsorship of each affected species via the Center for Plant Conservation imperiled plant collection. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 29 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | • Avoidance of sensitive and state-listed plants should be taken into account when developing the Project footprint and layout, and solar infrastructure should be sited and arranged to avoid impacting such plants.<br>• A trained desert botanist should be on-site during construction working with crews to avoid or minimize harm.<br>• Depending on the characteristics of the species and the specific locations, plants should be salvaged or fenced and protected from harm to the maximum extent practical. Cacti, yucca, and appropriate sensitive plants should be salvaged and made available for restoration on-site and elsewhere.<br>• Currently, the Tribal Ordinance does not dictate how state protected species will be applied or dealt with on tribal lands. To the extent it is not possible to avoid or salvage sensitive or state-listed plants, the Proponent should work with a trained desert botanist to identify other portions of the Tribal Lands on which the species occur and arrange with the Tribe and the Department of the Interior to preserve such lands for conservation purposes in perpetuity as compensation for the removal of habitat for such sensitive or state-listed plant species. | State-listing status is not regulated on Tribal lands.<br>See response to Comment #28; Per Section 5.1.4, trained biologists will be onsite during construction to minimize impacts to biological resources.<br>3rd bullet – The FEIS details mitigation of plant species, specifically cactus in Chapter 4, Section 4.5.2. |
| 30 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The treatment or spreading of noxious or invasive weeds could result in inadvertent mortality or injury of the native plant species. We request the public be afforded the chance to view and comment on the Weed Management Plan, which was not included in the DEIS. | This plan will be included as Appendix C of the FEIS, and publicly available prior to the Record of Decision. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 31 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The DEIS states that the Proponent will prepare a Site Restoration Plan for decommissioning. We request the public be afforded the chance to view and comment on the Site Restoration Plan, which was not included in the DEIS. | This plan will be included as Appendix F of the FEIS, and publicly available prior to the Record of Decision. |
| 32 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The DEIS states that an "Avian and Bat Protection Plan" will be produced to mitigate the take and adverse impacts to species protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, but fails to provide any details as to how the mitigation would be accomplished. We request that the public be afforded the opportunity to review the Avian and Bat Protection Plan prior to a final decision being made on the approval of this project. The proposed mitigations in section 5.1.4 of the DEIS are a good beginning. | This plan will be included as Appendix O of the FEIS, and publicly available prior to the Record of Decision. Specific measures detailed in the Plan have been added to Chapter 5 – Mitigation of the FEIS. |
| 33 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | While the DEIS assures us that the 72 acre-feet of ground water needed for this project will have no independent effects on this endangered species (Moapa Dace), we remain concerned. The White River Carbonate Flow System, of which the California Wash Basin is a part, is under heavy assault from on-going and proposed development. We believe some form of mitigation should be required to help ensure adequate monitoring of the spring flows vital to the dace should be required. | See Response to Comment # 16<br>The DEIS restates the conclusions of a Programmatic Biological Opinion (PBO) based on a Memorandum of Agreement that allowed up to 2500 afy may be withdrawn by the Tribe. The total withdrawal of 16,100 afy and the potential effects to the Moapa dace were evaluated in that PBO. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 34 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The Project site is within the range of the Gila monster. The Proponent should develop a plan for translocation Gila monsters if encountered during construction activities. | State protocol for Gila Monsters will be followed. See Response to Comment #21 |
| 35 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The DEIS limits the geographic scope of biological impacts to within the Tribal Lands. Although the DEIS also states that projects were included in cumulative analysis if information on them was available in the BLM's GeoCommunicator mapping system, the DEIS does not include a discussion of the cumulative impacts caused by numerous proposed solar energy developments on BLM lands in Clark County. We believe the geographic scope of biological impacts should be expanded to an area greater than the Tribal Lands to address ecosystem-level impacts, and should, at a minimum, address the cumulative impacts of multiple proposed large solar energy developments on adjacent or nearby BLM lands. | CEQ guidance (Jan. 1997) states that "Project specific analyses are usually conducted on the scale of …..Installation boundaries; whereas cumulative effects analysis should be conducted on the scale of human communities, landscapes, watersheds, or airsheds". Further, The 2005 CEQ guidance Memorandum "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis" states on Page 2 that "agencies may properly limit the scope of their cumulative effects analysis based on practical considerations" and goes on to say, "The extent and form of the information needed to analyze appropriately the cumulative effects of a proposed action and alternatives under NEPA varies widely and must be determined by the federal agency proposing the action on a case-by-case-basis.<br>It was our intention to utilize "landscapes" using the Valley as our Cumulative effects area; however, we concur with the guidance and will utilize the "watershed", in this case two watersheds to redraw this biological boundary. Watershed in this case is synonymous with "landscapes" and therefore covers both specifications in the CEQ document. The mapping will be updated and the analysis carried out appropriately within the FEIS. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 36 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | We are concerned that the discussion of the hydrology of the area and the plans for dealing with run-off waters from the project are inadequate. Some of the soils on the site are easily eroded by flowing water. The amount of run-off from the approximately 1400 acres of solar panels at full build-out will be quite significant. It is not unknown to have summer thunderstorm events that can dump up to two inches of rain in a 30 minute period in an area of a few thousand acres. When that happens at the site of this project the short term run-off will amount to more than 200 acre-feet of water, which will flow down California Wash into the Moapa Valley. Historically, there have been severe floods in the Moapa Valley due to flood waters coming from the California Wash. It appears this project will exacerbate flood flows in the California Wash due to the large area of absolutely impermeable surface of the solar panels. A statement that flood flows from this project will not exceed pre-project flows needs some clear and convincing documentation. | Water will not flow from the solar panels directly to the ephemeral washes; therefore, the statement about "impermeable" surfaces is false. The stormwater will hit the ground and flow in a similar manner to pre-construction. Vegetation left in place as well as topsoil replacement will aid in reduction of stormwater runoff and reduce velocity of sheetwash. Other controls such as berms and gabions within the ephemeral washes as noted in Chapter 4, Section 4.4.2 will also aid in controlling stormwater flows similar or less than that of pre-construction levels. |
| 37 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The DEIS talks about using gabions and detention basins for trapping sediment but doesn't discuss actual acreage of detention basins, volumes of water to be detained or release rates or how sediment accumulation in detention basins would be dealt with in order to preserve the functionality of the basins. Also, there is no mention of how the detention basins would be handled so as to prevent growth of tamarisk, a noxious weed in this area. These are items that need to be spelled out in detail in the DEIS. | Detention basins are currently not planned for this project. Sedimentation at gabions or within specific areas of the ephemeral drainages would be maintained according to a Stormwater Pollution Prevention Plan that will be prepared prior to any ground disturbing activities. Tamarisk is not currently found on site, however will be controlled according to a Weed Management Plan Found in Appendix C. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 38 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | In terms of sensitive plants there is a list of cacti and some shrubs but no annual plants are mentioned. This is probably due to the fact that the tortoise surveys were done in the Fall when annuals are not normally present. The result is that species like the Beaverdam breadroot (*Pediomelum castoreum*) and three-corner milkvetch (*Astragalus geyeri* var. *triquetrus*) are only mentioned as part of a literature survey. There is a significant population of Beaverdam breadroot a relatively short distance to the west of the project site on the southwest corner of the Moapa Paiute Reservation and threecorner milkvetch occurs in areas of eolian sand along and south of the powerline corridor in Dry Lake Valley not far west of the Crystal substation. The list of species considered in the biological assessment includes the Mt. Charleston Blue Butterfly that does not occur on the site or on impacted habitat but yet ignores important plant species which are found on or near the site. It is not logical to plan a pre-construction survey to assess the status of annual and perennial vegetation on the site just before the entire site is graded. The purpose of a NEPA analysis is to provide all pertinent information prior to project approval so that problems can be identified before irreversible decisions are made and actions taken. | Spring surveys for BLM and State sensitive species will be competed in Spring 2012 the on those portions of the Project managed by the BLM. State and BLM sensitive species are not regulated on Tribal lands. Please see the response to Comment #s 28 and 29. |
| 39 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | No mention is made of the Gila Monsters although they definitely occur in Dry Lake Valley and the lower reaches of the Arrow Canyon range only a short distance from the project site. | Gila Monster Protocol has been added to the FEIS. See response to Comment # 21 |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 40 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | The project proponents are planning to relocate desert tortoises collected from the site to another area on the Reservation but no specific plan for how this would be done or exactly where the relocation area would be is included. To just state that details will be worked out later is insufficient. Given the poor track record in relocating tortoises in the Mojave Desert the translocation plan, with details about preventing excessive predation, needs to be spelled out in this DEIS. The precarious state of tortoise populations in the Mojave Desert, and particularly the distinct population segment in the Northeast Mojave, mandates that the very best techniques for finding and relocating tortoises be employed. It appears that even under the best scenario all the hatchlings and most of the juveniles on the site will be lost with the construction of this project, so it is imperative that the adults that are captured continue to be part of a successful breeding population. | Additional details to the DETO Translocation Plan are included in the FEIS; the complete Plan will be included as Appendix B. |
| 41 | The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society | In the area of visual resources the pole structure towers proposed will be much more noticeable than the lattice style towers used in the existing power line corridor to the north of the site. Since lattice style towers have been in common use for many years for high voltage transmission lines the statement that there is insufficient time for testing and evaluating the lattice design doesn't make sense. Lattice style towers would be much less visually intrusive than the steel pole towers being proposed. | Nevada Department of Wildlife supports the use of poles because it reduces perching of predators; however, final design of poles has not been completed and lattice structures are still under consideration. Changes will be made in Chapter 5, Section 5.1.4 to reflect this. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 42 | EPA | Comments are in regards to pages 4-18 and 4-19. The detailed drainage study should occur prior to project implementation, so that the additional information it would yield can inform any needed adjustments in the project design. Such adjustments to project design could include increased buffers around the drainages and the inclusion of small detention basins. We recommend including the detailed drainage study in the Final EIS.<br>The adaptive management approach for managing erosion should be documented in the mitigation measures listed in Chapter 5. We recommend that a framework for an adaptive management plan be included in the Final EIS, including a discussion of the criteria that will be used to evaluate effectiveness of the erosion and sedimentation control measures and what modifications are available to address typical problems, to serve as a troubleshooting guide. For example, the framework should describe actions that could be taken if excessive erosion or sedimentation is observed. | The Corps of Engineers made a determination that there are no jurisdictional waters of the U.S. present on the site.<br>During this determination it was also noted that no bed and bank occurred in the existing ephemeral channels on the East side of the solar facility where the floodwater eventually exit under existing Railroad culverts. This suggests that natural drainage features reduce the floodwater flow a significant level as to reduce scour and thus sedimentation downstream. Topography of the area will not be greatly affected as caliche and rock are only covered by 1-foot of topsoil and in some cases, only inches. While leaving vegetation in place where practical, it is believed that post construction stormwater runoff will only slightly exceed or not exceed pre-construction levels. With the addition of in stream gabions to control these flows and management of these controls via a Stormwater Pollution Prevention Plan it has been determined that a detailed drainage study will not be required for on-site runoff. |
| | | Based on the information presented in the DEIS, we recommend that (1) the six large drainages be given wide buffers so the channels may adjust to the new hydraulic conditions without the need for major human-made structures (2) permanent sediment and channel elevation monitoring stations be established to assist in the adaptive management of erosion and sedimentation (3) low-impact development techniques, such as bioretention, be explored as potential mitigation for changes in the drainage pattern. | Due to the presence of six large, steep side drainages, maximum coverage by solar PV will be required to meet the proposed 350MW potential; however buffers will be used as much as practical around the ephemeral drains; this will be updated in the FEIS. Adaptive management measures has been updated and elaborated on in Chapter 5 - Mitigation. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 43 | EPA | This comment is in regards to Construction Vehicle Emissions. The mitigation measures that EPA previously recommended are reasonable, and we continue to recommend that they be incorporated into the project. Any approvals made by the BIA for the project should include a condition that the lessee incorporate the following measures into construction contracts. For more information on nonroad mobile sources and mitigation, see at http://www.epa.goc/nonroad.<br>(1) Maintain and tune engines per manufacturer's specifications to perform EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies. (2) Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained. (3) Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations. (4) If practicable, lease new, clean (diesel or retrofitted diesel) equipment. In general, commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible. (5) Utilize EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site. (6) Develop construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow. | These recommendations have been made to the proper mitigation Section found in Chapter 5. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 44 | EPA | This comment is in regards to fully representing cumulative impacts on the desert tortoise. EPA recommends that the spatial scope of the cumulative impact assessment for the Mojave desert tortoise be expanded, consistent with the Council on Environmental Quality (CEQ) guidance. We recommend consulting with USFWS on an appropriate boundary for this analysis. We understand that the USFWS will consider impacts across the range of the species for the Biological Opinion that will be issued under Section 7 of the Endangered Species Act. BIA may wish to incorporate information from the BO into the Final EIS to improve this analysis. However, we note that the application and interpretation of the definition of cumulative impacts under NEPA and ESA differ, and BIA should ensure the analysis in the FEIS is consistent with CEQ guidance. | CEQ guidance from the 1997 manual and 2005 memorandum has been applied to the FEIS per the comment. We have consulted with USFWS on impacts to the species within the cumulative impacts area. We have incorporated information from the Biological Opinion to improve the analysis. |
| 45 | EPA | The DEIS contains contradictory information regarding the capacity of the water wells. Page 2-33 states that the secondary water source test wells are estimated to have the ability to deliver water at 1,000 to 1,500gpm, a capacity greater than the existing proposed use well, however Page 4-14 states that the existing proposed use well is capable of providing more than 1,700 gpm of water, which is obviously not less than the amount cited for the secondary water test wells on p. 2-33. The FEIS should clarify this. It should also provide additional information regarding the likelihood/frequency that the unimproved road to the secondary wells would be utilized, and ensure that mitigation measures are included to ensure desert tortoise do not get crushed on this road. | We have reviewed and clarified the flow rates from both wells. The Text on Page 4-14 has been updated.<br>Text has been added to clarify use and mitigation measures on the secondary well access road.<br>Well data from TH-1 has been updated on Page 4-14 to 60gpm. |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 46 | EPA | The induced growth (indirect effects) associated with the additions to the Travel Plaza that electrification would support (p. 2-19) should be disclosed. | The Tribe has indicated that no future growth is planned; the FEIS has been updated with this text. |
| 47 | EPA | In several places in the DEIS, there is reference to compliance with applicable federal, state and local laws and regulations, or with Laws, Ordinances, Regulations and Standards (LORS). Because the project is on tribal land, it is important to identify which laws are applicable, and if laws are not applicable, to identify the specific regulation or standard that is being specifically adopted for the project. | The draft lease provides that "all Tenant Work shall be constructed in accordance with all building, construction and/or safety requirements (including, without limitation the Building Code, Electrical Code, Plumbing Code, Mechanical Code and Solar Energy Code) set forth in the Code of Clark County, Nevada which would be applicable to the Project if it were constructed under the jurisdiction of Clark County, Nevada." The above text has been substituted for areas in the FEIS where LORS is referenced. |
| 48 | EPA | In many places throughout the DEIS, there is reference to using the "respective methodology prescribed by NEPA." NEPA does not prescribe methodologies, so this wording should be amended. | Text has been revised and statement removed. |
| 49 | EPA | The DEIS also notes that the drainages onsite flow into the California Wash and then into the Muddy River (p. 4-17). The DEIS also states that "The Proposed Project does not contain, nor is tributary to, any waterbodies that are on Nevada's 303(d) list for exceeding state water quality standards (Nevada Division of Environmental Protection 2009)", but notes that the Muddy River is considered impaired and is on the 303(d) list (p. 3-16). This inconsistency should be corrected in the FEIS. | Text has been updated to read "nor is a DIRECT tributary" |

**Table 6-2 Continued**

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 50 | EPA | EPA previously recommended that water conservation features be included in the office and maintenance building's bathrooms and that, if landscaping will occur around the office, xeric or drought-tolerant native landscaping be used. We continue to recommend that low-flow toilets and faucets be installed in the offices and maintenance buildings, and that any landscaping minimize the use of irrigation water. | Text has been added to address "xeric" landscaping if landscaping is used. Text has been added to include mitigation measures such as low-flow toilets and faucets and use of irrigation water. |
| 51 | EPA | EPA previously commented against the use of single-sided printing for the Administrative DEIS, and we noted that the DEIS also uses single-sided printing. The BIA, as a federal agency, is subject to Executive Order 13514 – Federal Leadership in Environmental, Energy, and Economic Performance (October 5, 2009) which specifies that it is the policy of the United States that "Federal agencies shall…eliminate waste…". Additionally, the Federal Acquisition Regulation (48 CFR 23.703) states that agencies must "Promote cost-effective waste reduction…". We recommend that the FEIS be printed double-sided. | Double sided printing will be used. |
| 52 | EPA | Jane Feldman, Sierra Club, commented if there will be a 30 or 45 day comment period for the Desert Tortoise Translocation Plan and the Avian and Bat Plan (Bird and Bat Conservation Strategy). | These plans will be included as Appendix C and Appendix O of the FEIS, and publicly available prior to the Record of Decision. |
| 53 | EPA | Vinny Spotleson, Sierra Club, suggested that if more time was allowed to comment on documents such as on the draft EIS, translocation plan, etc., the less controversy should occur. | See Response to Comment #52 |

Table 6-2 Continued

| Number | Agency or Other | Comment | Response |
|---|---|---|---|
| 54 | Tribe | Vicki Simmons, tribal member, commented if aircraft will be affected by the Project and if aircraft will be allowed to fly over the Reservation. | As assessed in the DEIS, there will be no impact to aircraft flying over or near the Proposed Project. |
| 55 | Red Rock Audubon Society | John Hiett from Red Rock Audubon Society citizen asked if the Applicant had a power purchase agreement to date. | The Applicant is currently evaluating power purchase agreements. |

### 6.2.4. Final EIS Preparation and Distribution

The FEIS will be made available on the project Website (http://projects2.pirnie.com/MoapaSolar/) and at the BIA Western Regional Office Branch of Environmental Quality Services, 2600 North Central Avenue, 4th Floor Mail Room, Phoenix, AZ 85004–3008. In addition, a copy will be sent, at their request, to any party who provides comments to the DEIS and/or requests that they be added to the mailing list. Further, the posting of the FEIS will be acknowledged in the Federal Register and within Proposed Project local papers. The FEIS will be distributed to the BIA Western Regional Office, the BIA Southern Paiute Agency, the BLM, the USEPA, the BIA solicitor's office in Washington, DC, and the Tribe.

### 6.2.5. Record of Decision

The BIA will prepare a Record of Decision (ROD) on their decision on the Lease Agreement. The ROD will be posted on the project Website (http://projects2.pirnie.com/MoapaSolar/). The ROD will be mailed to the cooperating agencies and to the parties that requested a copy. Publication of the ROD Notice of Availability will be posted in the *Federal Register*.

### 6.2.6. Appeal Rights

Within 30 days of the signing of the ROD, any adversely affected party has the right of appeal, in accordance with the regulations in 43 CFR 4.400 unless the ROD is signed by the Secretary of the Interior.

## 6.3. Consultation with Others

### 6.3.1. Federal, State, and Local Agencies

The following federal, state, and local agencies were provided an opportunity to consult during preparation of the EIS:

- Bureau of Land Management
- U.S. Fish and Wildlife Service
- Department of Defense (Nellis Air Force Base)
- National Parks Service
- Nevada Division of Environmental Protection
- Nevada Energy
- Natural Resources Conservation Service (Mojave Special Projects Office)
- US Environmental Protection Agency, Region 9
- Nevada Department of Transportation
- U.S. Army Corps of Engineers
- Nevada Department of Wildlife
- Nevada State Historic Preservation Office
- Southern Nevada Water Authority

### 6.3.2. Non-Governmental Organizations

The following NGOs were provided an opportunity to consult during preparation of the EIS:

- The Nature Conservancy
- Red Rock Audubon Society
- Lahontan Audubon Society
- Desert Tortoise Council
- Friends of Nevada Wilderness
- Nevada Wilderness Project
- Sierra Club
- Center for Biological Diversity
- Sierra Nevada Alliance
- Nevada Clean Energy Campaign
- Center for Energy Efficiency and Renewable Technologies
- Environment America
- Great Basin Resource Watch
- Nevada Wildlife Federation
- Nevada Natural Resource Education Council
- Natural Resources Defense Council
- Nevada Conservation League
- Western Resource Advocates

- Professor Paul Friesema Environmental Policy and Culture Program
- Conservation District of Southern Nevada
- The Conservation Alliance
- Friends of Gold Butte
- Union Pacific Railroad Company
- Nevada Environmental Coalition, Inc

The Center for Biological Diversity provided comments during the public scoping period. See Section 6.1.3 Scoping Response for details on the comments.

The Center for Biological Diversity, Sierra Club, Red Rock Audubon Society and several state and federal agencies provided comments during the DEIS review period. See Section 6.2.3 Draft EIS Public Response.

### 6.3.3. Native American Tribes

The following tribes were given notice of the Proposed Project during the Notice of Intent phase:

- Lucille Campa Chairperson, Las Vegas Tribal Council
- Manuel Savala Chairman, Kaibab Paiute Tribal Council
- Richard Walema, Sr. Vice-Chairman, Hualapai Tribal Council
- Timothy Williams Chairman, Fort Mojave Tribal Council
- Leroy N. Shingoitewa Chairman, Hopi Tribal Council
- Eldred Enas Chairman, Colorado River Indian Tribes
- Charles Wood Chairman, Chemehuevi Tribal Council
- Jeanine Borchardt Chairperson, Paiute Indian Tribe of Utah Tribal Council

The Hopi Tribe expressed an interest in consulting on the Proposed Project if it were determined to have an effect of Prehistoric Ancestral Pueblean Sites. They also requested a copy of the Cultural Resource Survey Report for the project. The Cultural Resource Survey Report revealed no Prehistoric Ancestral Pueblean Sites within the area of the Proposed Project.

# 7. List of Preparers and Reviewers

The following individuals participated in the preparation and review of the FEIS:

| Name | Responsibility |
|---|---|
| **Bureau of Indian Affairs** | |
| Amy Heuslein | BIA Lead / Branch Chief |
| Garry J. Cantley | Regional Archeologist |
| Stan Web | Realty Officer |
| Tamera Dawes | Realty Specialist |
| Diane Mitchell | Realty Specialist |
| Charles Lewis | Environmental Protection Specialist |
| **Southern Paiute Agency** | |
| Kellie Youngbear | Agency Superintendant |
| Christina M. Varela | Assistant Realty Specialist |
| Paul Schlafly | Natural Resource Specialist |
| **Moapa Band of Paiutes** | |
| William Anderson | Chairman – Tribal History |
| **BLM Las Vegas Office** | |
| Mark Chandler | Visual Resource Management |
| Kathleen Sprowl | Cultural Resources |
| **K Road Power** | |
| Tom Tureen | President – Tribal Issues |
| Ralph J. Grutsch | Managing Director – Technical Engineering |
| Mark Freidland | Managing Director – Quality Control |
| Keith Heffelfinger | Program Manager – Technical Engineering |
| Sean Gallagher | Public Relations |

| Name | Responsibility |
|---|---|
| **ARCADIS-US** | |
| Chad Martin | Quality Control – General Production |
| Scott Walker | Biological Resources / Socioeconomics |
| Deanna Sharp | Biological Resources / Visual Resources |
| John Kinsey | Biological Resources |
| Tara Raabe | Biological Resources |
| Alexander Mathes | GIS Mapping |
| Kristen Frey | Air Quality |
| Carl Spath | Cultural Resources |
| Kevin Fowler | Noise |
| Susanna Li | Water Resources |
| Wendy Gordon, Ph.D. | Technical Editing |
| Colin Melson | Hazardous Materials |
| Prasoon Sinha | Traffic and Transportation |
| Debbie Arizpe | Technical Editing |
| Black Eagle, LLC. | Geology |
| **OTHERS** | |
| Josh Reid | Council for Tribe |
| Jennifer Carleton | Council for Tribe |
| Dorothy Hallock | Third Party Consultant to BIA |
| Allen Gross | Third Party Consultant to BIA |
| Beau Goldstein | Third Party Consultant to BIA |
| Karen Vitulano | EPA |
| Patricia McQueary | USACE |
| Gary Marmer | Argonne National Laboratory |
| Anthony Dvorak | Argonne National Laboratory |

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